THE IRON AGE

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A Buffalo Foundation Problem.

The New York State Steel Company's Solution.

The selection of Buffalo, N. Y., as the site for large steel and iron plants has presented numerous difficult engineering problems, owing to the nature of the land in the southern section of the city where these plants are located. While the situation is most advantageous commercially, the unstable character of the ground gives rise to unusual expense and trouble in laying secure foundations for the heavy equipment of a modern rolling mill or for large furnaces. The Lackawanna Steel Company, whose plant is situated directly on the shore of Lake Erie, has a site which was originally almost entirely swamp land or low meadows, the surface consisting of varying depths of decayed vegetable matter. Below this lies a body of quicksand and clay. The foundations for the 55 x 60 in. engine which drives the 48-in. universal mill, and the 48 x 60 in. engine which drives the 32-in. slabbing mill, rest on bed rock, or rather on the dense hard pan which overlies the rock, and which cannot be turned by a pick. These foundations were very expensive, entailing the most careful excavation work for a depth of 35 ft. and requiring probably 2500 cu. yds. each of concrete in a monolithic mass. The Buffalo & Susquehanna Iron Company, the immediate neighbor of the Lackawanna Company, was much more fortunate in its site, as the rock lies within 10 ft. of the surface where the company's ship canal enters, and the Pennsylvania Railroad Company's ore dock, on the other side of the same canal, was made by stripping the surface to rock and building concrete retaining walls, thus eliminating forever the question of a settlement under the heaviest load that could be placed upon it.

The New York State Steel Company, whose plant is situated northeast of the above mentioned properties and inland on the Buffalo River, was confronted with practically the same conditions as those obtaining at the Lackawanna Steel Company's works in regard to foundations for the 48 x 60 in. engine which is to drive the 36-in. blooming mill, with the addition of a serious detrimental feature which the Lackawanna escaped—namely, water. This was owing to one marked difference in the underlying strata of the two sites. The ground elevation of the New York State Steel Company is about 10 ft. higher than that of the Lackawanna Steel Company, and the top soil of the larger part of the property is much better, consisting of from 8 to 12 ft. of firm yellow clay. But at the point where the blooming mill and engine are located this top soil suddenly failed, and a test pile and test hole developed very different conditions. The test hole was 11 ft. square, protected by a 9-in. wooden casing made of three walls of 3-in. plank, sunk to a depth of 19 ft., in the center of the space to be occupied by the 48 x 60 in. engine. This is shown in Fig. 1.

An examination of Fig. 2 will show the different strata which were encountered. The shelf of gravel, which was probably river bottom formerly, is firm, but admits water freely in places. As the test pile showed solid rock to be in the neighborhood of 60 ft. down, the expense necessary to reach it was prohibitory, so it was decided to rest the foundation on piles driven at 4-ft. centers, and followed from the surface 18 ft., so that the cut-off would occur in the gravel stratum, which would form the bottom of the concrete block.

Fig. 1.—Sinking the Test Hole in the Space to Be Occupied by the New York State Steel Company's 48 x 60 In. Engine.

As it was necessary in excavating to pass through a 4½-ft. layer of quicksand, the next question was how to preserve the lines of the excavation and prevent an influx of sand and water. The company decided to try steel sheet piling, and as it was desirable to do the work in sections it was necessary to obtain piling sufficiently strong to be driven, drawn and redriven. The section offered by the United States Steel Piling Company was considered to answer these requirements, and the mill foundation was begun. The piling drove easily and was battered only slightly, although no head block was used. Fig. 3 shows the mill excavation where the first set of shores was put in, 4 ft. below the surface.

A small centrifugal pump was placed at one end of the excavation and easily took care of the water, which

entered freely, however, as soon as gravel was encountered. As it appeared only in several spots, like so many springs, the water was piped from each spring to the

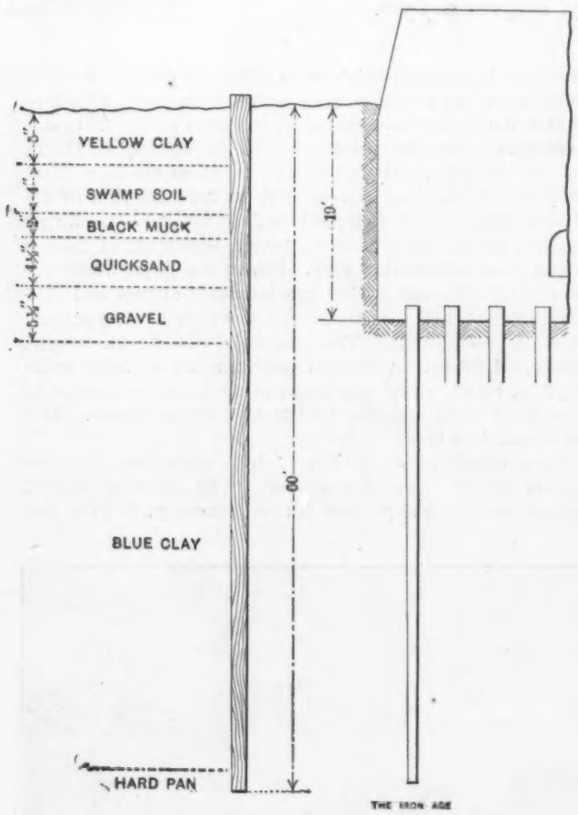


Fig. 2.—The Different Strata Encountered in Preparing Foundations for the New York State Steel Company's 48 x 60 In. Engine.

pump pit, and when the concrete was placed the water took its course through these pipes, which were plugged as soon as the concrete had set, leaving a solid bottom. To facilitate drawing the piling 3-ply tar paper was placed against it, so that the concrete was not in direct contact with it. When the surface was reached the piling was drawn by making some simple changes in the driving rig, and was found to be very little the worse for wear. The same course of procedure then followed with the engine foundation.

To make a common block of the two sections a series of steps was formed back in the mill foundation which would eventually make a huge key when the concrete of the engine foundation was brought up. The latter foundation was much more intricate than that of the mill, having three tunnels from which the bolt alleys lead, instead of one. Fig. 4 shows this part of the work and the mill foundation. The number of bolts required in the engine and mill foundation was 126. In addition to these, four 4-in. bolts steady the pinion housing, the bolts being anchored to heavy 15-in. I beams which cross and are buried in the mill foundation at a depth of 16 ft. These steady bolts are plainly seen in Fig. 4. The excavation for the entire foundation amounted to 2000 cu yds., and the block of concrete consists of 3300 cu. yds. Fig. 5 shows the finished work, which is a very stable and handsome foundation.

The success of the method employed may be judged from an engineering standpoint by the fact that no disturbance whatever can be noted in the adjoining work, everything exterior to the excavations being held in line by the steel piling. The success of this plan led to its being followed in sinking the company's coal tower pit. This pit, which is 2 ft. deeper than the engine foundation, has walls and floors 3 ft. thick, parted in the middle by a waterproof felting, and the work was so successfully accomplished that the concrete base was placed and set without any cement washing out of the form, although a 6-in. centrifugal pump was in constant use. The work was planned and directed by R. R. Hillman, superintendent of construction for the New York State Steel Company, and was executed by A. F. Chapman & Co., contractors, of Buffalo.

A brick chimney on a concrete foundation has recently been erected in Newark, N. J., its hight being 350 ft. and outside diameters 27 ft. 6 in. at the bottom and 9 ft. 10 in. at the top. The inside diameters are, respectively, 20 and 8 ft. The ground was covered with 4 in. of filling, underlaid with 6 in. of semipeat and 18 in. of clay. Below this are 10 feet of sand, on top of 50 ft. of soft clay. The concrete base is 14 ft. thick and contains about 800 cu. yd. of material. It rests upon 324 yellow pine piles, 50 to 57 ft. in length, and spaced 30 in. centers over a square of 45 ft. to the side. The tops of the piles were left projecting 12 in. above the earth, this portion being then embedded in the concrete of the base.

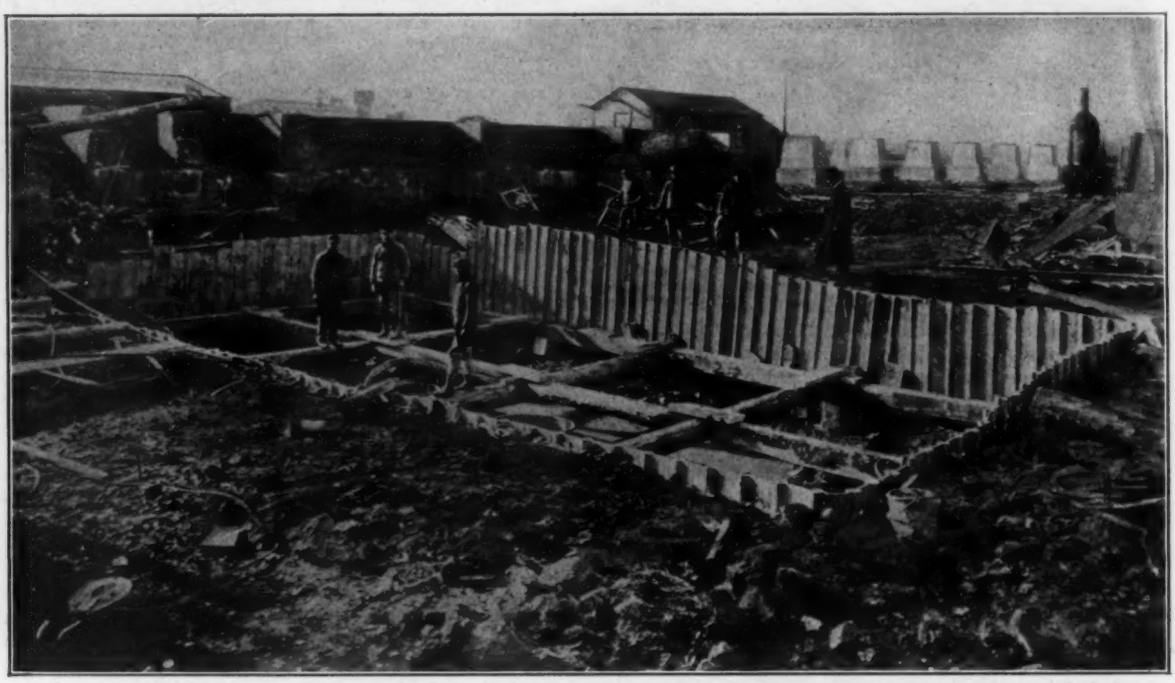


Fig. 3.—The Mill Excavation of the New York State Steel Company, Showing Steel Sheet Piling.

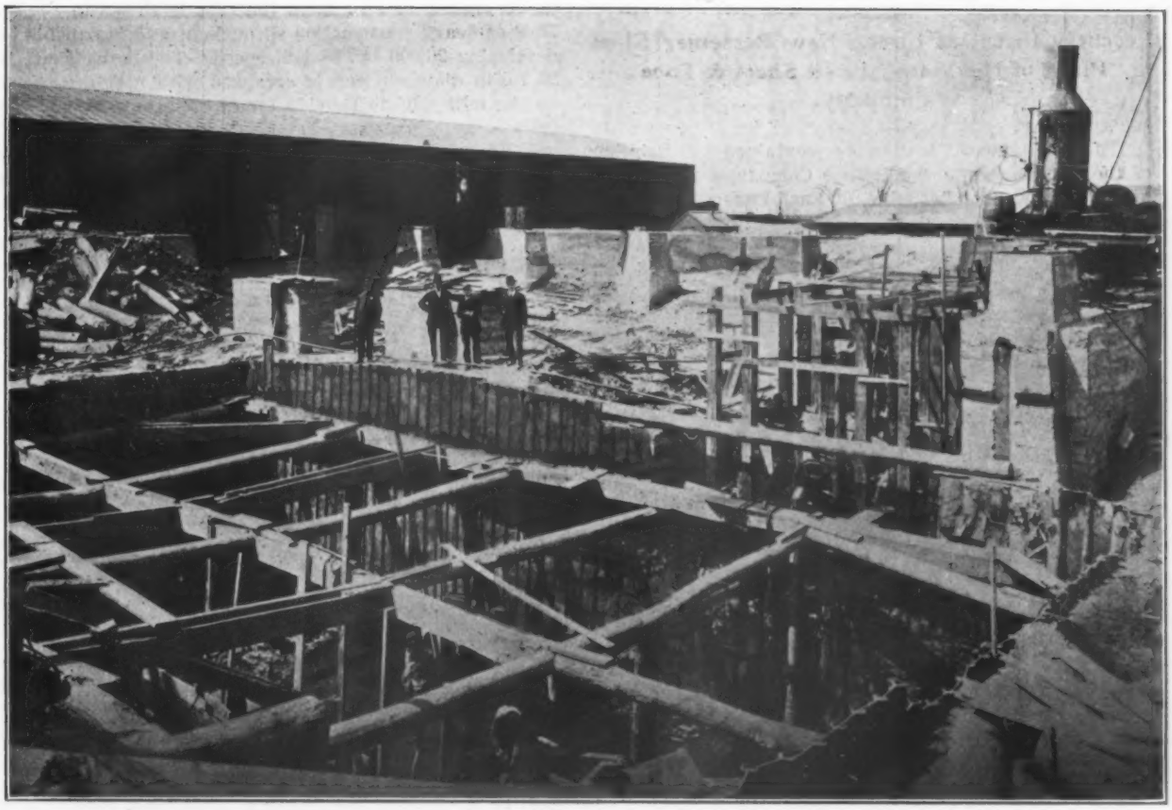


Fig. 4.—Keying the Mill Foundation to the Engine Foundation of the New York State Steel Company.

Fig. 5.—The Completed Foundations for the Mill and Engine of the New York State Steel Company.

Two Large Tod Engines.

Recently Installed in the New Bessemer Steel Plant of the Youngstown Sheet & Tube Company.

The last issue of *The Iron Age* contained a description of the Youngstown Sheet & Tube Company's new Bessemer plant and finishing mills, at East Youngstown, Ohio.

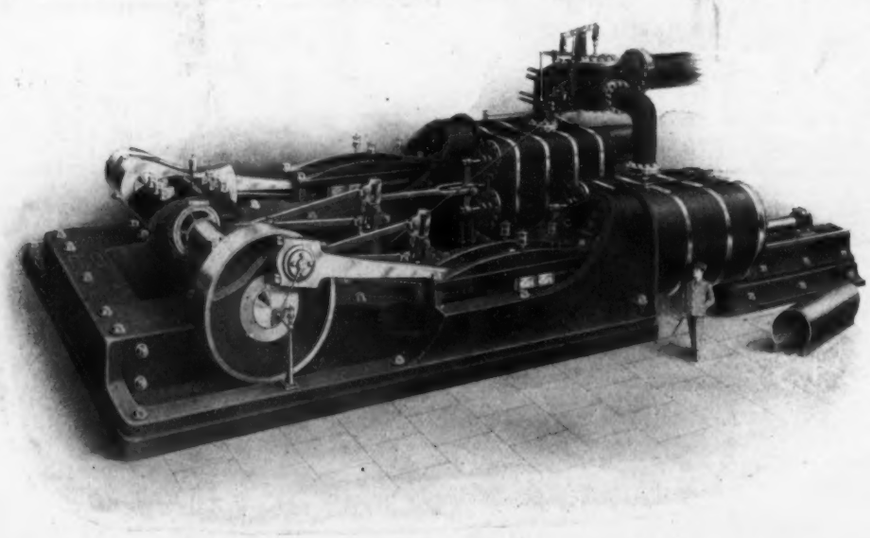


Fig. 1.—Side View of a Large Blooming Mill Reversing Engine Built by the William Tod Company, Youngstown, Ohio.

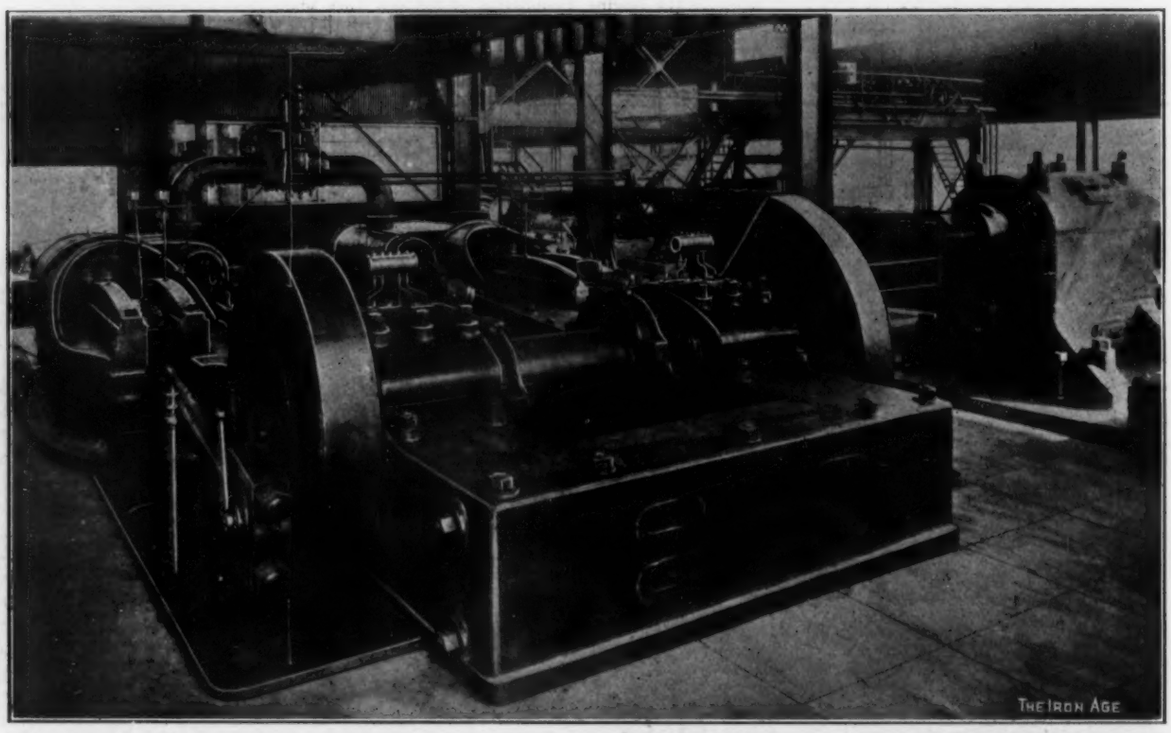


Fig. 2.—The 54 x 66 In. Twin Cylinder Tod Blooming Mill Engine in the Youngstown Sheet & Tube Company's Plant.

The views herewith show two large engines which are installed in this plant, furnished by the William Tod Company, Youngstown, Ohio. The first, a blooming mill reversing engine, shown in Figs. 1 and 2, drives the blooming mill, which is described in the previous article and shown in Fig. 6 accompanying it. Fig. 2 herewith shows the engine and is very nearly a continuation of the view given in the Fig. 6 referred to, if placed to the left of it.

The blooming mill engine has twin cylinders, 54 in. in diameter by 66 in. stroke. The cylinders are fitted with twin tubular piston valves. The general appearance of the engine, as seen from the side, is shown in Fig. 1. It is of heavy construction throughout and is capable of developing 25,000 hp. at full speed. The crank shaft is 26 in. in diameter and is arranged with a return crank on the mill side to provide for direct attachment to the rolls.

The cranks are of cast steel and are thoroughly counterbalanced to secure absence of vibration at high speeds. It will be noticed that no flywheel is provided. Similar engines have demonstrated that none is required, the heavy cranks and counterweights providing all the inertia necessary for smooth running. The cranks and pins are forced into place by hydraulic pressure. The main bearings are 26 in. in diameter by 50 in. long. The crank pin on the outside is 15 in. in diameter by 13 in. long, and on the mill side the pin is 25 in. in diameter by 13 in. long. The frames are of flat guide type, offering easy access by an overhead crane. The crossheads are of steel with the pins cast in, these pins being 14 in. in diameter by 14 in. long.

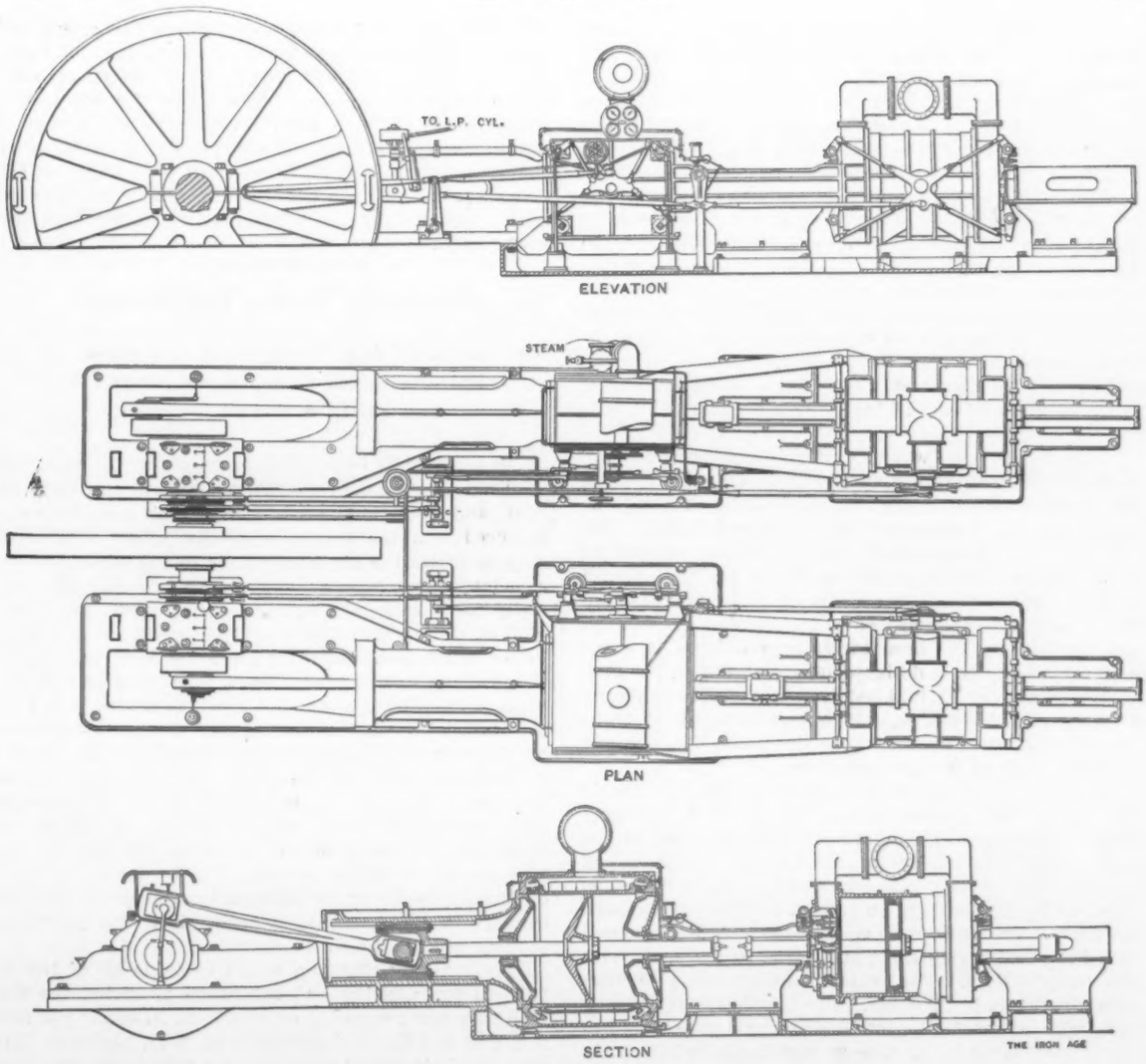


Fig. 3.—Elevation, Plan and Section of a Tod Cross-Compound Blowing Engine.

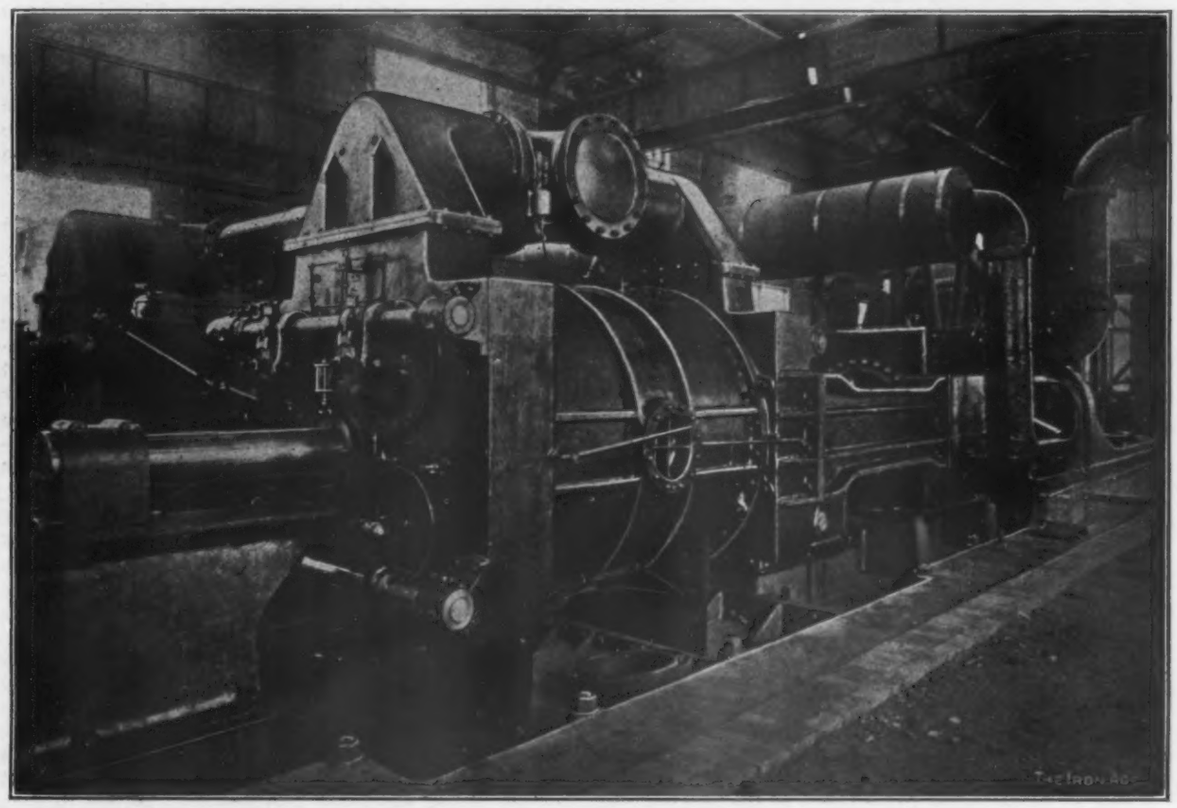


Fig. 4.—The 44 and 84 x 76 x 72 In. Blowing Engine in the Youngstown Sheet & Tube Company's Plant.

The conical steel pistons are carried clear of the cylinders on 14-in. hollow forged piston rods, which are supported between the main and tail crossheads. The pistons are fitted with sectional cast iron packing rings, and the rods have metallic packing throughout. The reversing gear is of the Stephenson type, with special parallel motion for supporting the link block. The links and all of the rockers and arms are of cast steel. The reverse is operated by means of horizontal steam and oil cylinders having floating piston valve gear, enabling the links to be graded at any point desired and permitting of maximum speed in reversing.

The throttle valve is of the double-ported piston type, operated by steam and oil cataract cylinders. The operating gear extending to the pulpit is specially designed to be free from back lash. The engine has a continuous oiling system, all bearings being provided with sight feeds and oil catchers.

Figs. 3 and 4 show views of the blowing engine installed at the Youngstown Sheet & Tube Company's plant, Fig. 3 including an elevation, plan and section of the engine, and Fig. 4 showing it as it appears installed. The engine has cross-compound steam cylinders, 44 and 84 in. in diameter, with a pair of 76-in. air tubs placed tandem. The engine has a stroke of 72 in. for all cylinders. It is of extremely heavy construction throughout, and accessibility has been carefully considered in every detail. The engine is designed to run at 40 rev. per min. against 25 lbs. per sq. in. blast pressure, with a maximum blast pressure of 30 lbs. and a maximum speed of 50 rev. Under the latter conditions the piston displacement is 37,500 cu. ft. of free air per minute.

The general design of the engine is shown in the illustration. The frames are of the usual heavy duty bored guide type, with guides and bearings cast in one piece. The bearings are of the babbitted quarter box type, having removable shells. The shaft is 24 in. in diameter in the bearings and 28 in. in diameter through the wheel. The 24-in. flywheel is made in halves, secured with bolts and shrink links and keyed to the shaft with two tangent keys. The crank arms are steel castings with pins 13 in. in diameter. The crossheads are of cast steel, with adjustable babbitted shoes, and are secured to the rods by taper keys. The crosshead pin is 11½ in. in diameter by 13 in. long.

A heavy cast iron sole plate is secured to the main bed plate and extends back under the steam and air cylinders to the rear of the tail rod supports. This bed plate is very deep and rigid, and provides a pan to catch all drip from around the cylinders. The steam cylinders are firmly bolted to the engine frames, and slide freely at their rear ends on adjusting wedges, while the air cylinders are rigidly tied to the steam cylinders and rest on thin vertical plates, secured transversely to the sole plates, so as to permit free expansion in a longitudinal direction while preserving correct alignment of the engine.

The 44-in. high pressure and 84-in. low pressure cylinders are each provided with a single wrist plate valve gear with Reynolds detaching gear and single plunger dash pots. The steam and exhaust passages are double ported for both cylinders. An overhead receiver is provided and forms the connection between the high and low pressure cylinders. The conical steel steam pistons are carried by cambered steel piston rods, which are supported at both ends by crossheads in such a manner that the pistons float clear of the cylinder walls. The pistons are fitted with steel followers and a special type of follower studs, designed to prevent any possible accident from breakage of studs.

The air pistons are of cast steel, of hollow drum shape, cast in two parts and riveted together. They are fitted with cast iron junk rings with soft metal strips and with cast iron sectional packing rings. The air cylinders are equipped with Tod patented double-ported piston inlet valves and automatic outlet valves. The air valves are all driven from a single wrist plate on each cylinder, which has a corresponding eccentric on the main shaft. The outlet valves are of pot form and have their stems extended to the outside so that they are extremely accessible for adjustment. The operation of the gear is such as to secure the full capacity of the blowing tubs, there being no special difference between the atmospheric pressure and the pressure in the tub during the inlet stroke. The valves being placed in the heads, a remarkably small clearance space is secured. The engine is fitted with an automatic safety stop governor. Suitable sheet steel oil guards over the cranks and eccentrics provide for catching all waste oil, which is returned to a filter for continuous use. All main bearings throughout are provided with pressure sight feed oilers, and the smaller pins have grease cups.

Drafting Room Ventilation.

An Air Washing Equipment Installed at the Illinois Steel Company's Works by the Buffalo Forge Company.

In many cases there is an objection to the fan system of direct heating and ventilating, due to the fact that dust and soot and occasionally foul gases are introduced into the rooms, especially when it is necessary to locate the air intake near to the street level or a neighboring chimney. This feature would be especially unpleasant in a drafting room, where the deposit of dust on the drawings would be a serious annoyance to the draftsmen. Recently there has been installed in the drafting room at the Illinois Steel Company in Chicago an interesting equipment in which provision is made for washing the air, the equipment being one furnished by the Buffalo Forge Company, Buffalo, N. Y. Details of the apparatus are shown in the accompanying engraving. The entering air passes into the tempering coils through a grating placed near the corner of the building. The tempering coils contain 1000 ft. of 1-in. pipe and serve in cold weather to raise the temperature of the air to 70 or 80 degrees F., whence it proceeds directly to the air washer, which it is the particular purpose of this article to describe.

The washing chamber, which contains all of the apparatus for washing and afterward removing the free moisture, has a capacity of 10,600 cu. ft. of air per minute, and is 4 ft. 10 in. wide, 4 ft. 8 in. high and 7 ft. long. This is indeed a small space when compared with that required for coke screens or cheesecloth filters. The saving of space is not, however, the only advantage, for the device has shown itself after several installations to be entirely automatic and satisfactory in the performance of its duty, which was not true of the old type filters.

The washing itself is accomplished by spraying the incoming air from 76 specially designed nozzles, the water being projected parallel to the direction of the air travel. Each of the nozzles will atomize between 1½ to 2 lb. of water per minute, the water being supplied by a pump, as will be explained later. The nozzle is unique in that the water passing is atomized by centrifugal force acquired by its own circular path in leaving the nozzle exit. So complete is this atomizing action that the spray can scarcely be seen. It will readily be appreciated that the air contact offered by such an immense amount of water surface as would be represented by 125 lb. of atomized water per minute would readily accomplish the cleansing of all the air that could be drawn through the washer at speeds usable in ventilating. This allows approximately 1 lb. of water per pound of air.

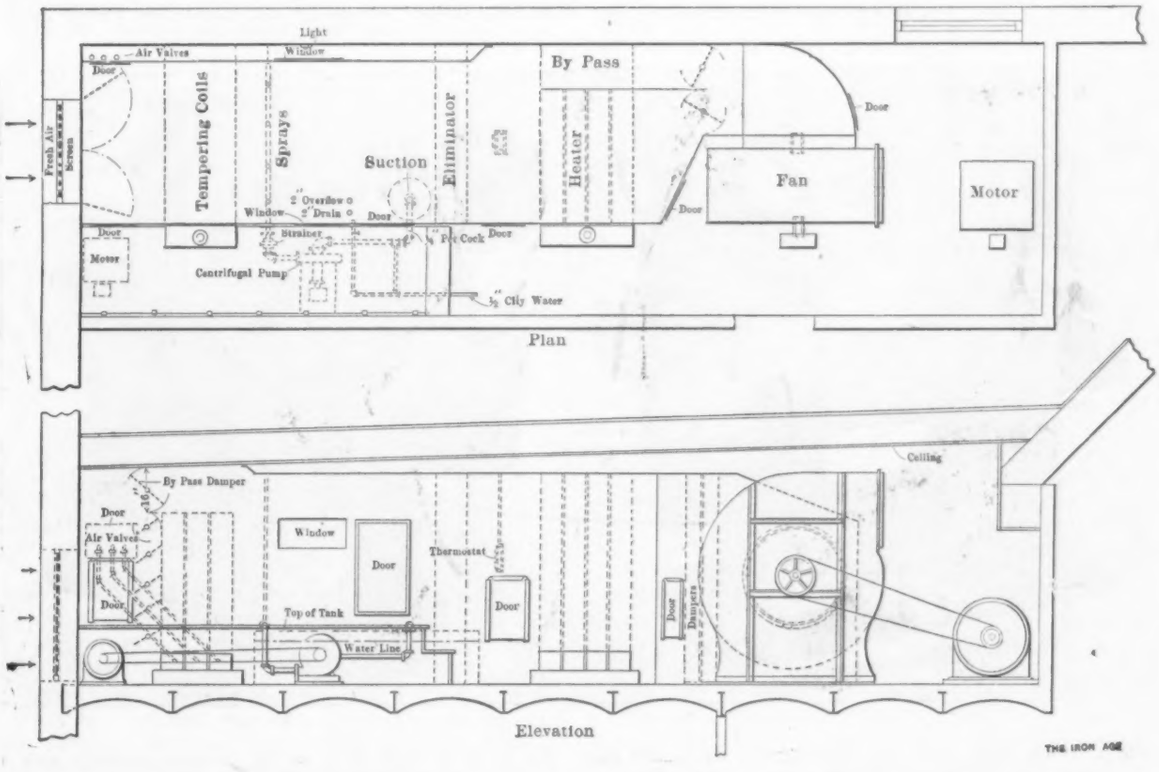
The washing being accomplished, the next difficulty is to remove the free moisture. This is done in the next foot of air passage, which allows approximately 1-5 sec. to dry each particle of air passing, yet the eliminator reduces the moisture to 70 per cent. relative humidity. The washing is completed and the free moisture removed by drawing the air through what have been styled "eliminator plates," consisting of a system of vertical baffle plates. The first part of each plate presents to the air merely a water covered surface, to which the solid particles originally present in the air will cling and be left by the air as it passes to the second or rear part of the plates, which are provided with gutters running

lengthwise to break the continuity of the water film and prevent it from being blown from the far side of the plates by the onrushing air. The water removed from the air drains to a settling tank built beneath the eliminator in the concrete foundation, and above which the eliminator plates are supported on 4-in. galvanized I-beams. Provision is made in the settling tank for drawing off the accumulated water, and then the clearer water is led to a well, with which the suction of the small brass centrifugal pump, belt driven by a 2-hp. alternating current motor, is connected, and then this water after straining is supplied again to the nozzles. The nozzles are readily taken apart by removing a knurled cap, and any scum that may have been deposited may then be removed.

It is unique that the degree of humidity is controlled through the agency of a thermostat, a heat indicating instrument. The amount of moisture which the air will absorb in the form of water vapor has been found after careful test to depend more upon the temperature of the water exposed to the air than upon the air temperature. Therefore if the thermostat be set and calibrated by trial and it controls a steam jet playing into the water supplied to the spray nozzles it can control the spray water temperature, and hence the humidity, which is kept at a constant percentage of the saturation point at all temperatures.

The washing chamber and eliminator plates, which are of galvanized iron, are housed in the same material, stiffly braced, riveted and soldered so as to be water tight. In the washer casing is placed a water tight door and two plate glass windows, to allow inspecting the action of the apparatus while it is in operation. Connecting with this housing on the washer end is the inlet conduit, and the other end connects with the heater coils. After leaving the latter, which contain 1500 ft. of 1-in. pipe, and passing through a 70-in. blower provided with a double set of curved blades, the air is forced through a system of ducts to the various parts of the drafting room. The blower is belt driven by a Westinghouse 5-hp. alternating current motor, and makes 475 rev. per min., at which it has a capacity of 10,600 cu. ft. of air per minute.

The contract as accepted by the Buffalo Forge Company included the furnishing and erecting of all of the apparatus.



Plan and Elevation of the Buffalo Air Washer and Associated Apparatus for Ventilating the Drafting Room at the Illinois Steel Company's Works.

The Passing of Missouri's Iron Mountain.

The Iron Mountain Company, which for many years mined and sold ore from the famous Iron Mountain in Missouri, was dissolved by the Circuit Court of St. François County, Mo., on July 12. The assets having been divided the stockholders unanimously petitioned for dissolution. It is stated by St. Louis papers that the Iron Mountain mine paid more than $7,000,000 in dividends on its capitalization of $3,600,000. Fifty years ago Government experts considered the iron ore in the mountain practically inexhaustible, but in 1893 the Iron Mountain Company was compelled to suspend operations on the extensive scale of the preceding years. There is still ore left in the remains of the mountain, but not enough for any paying operation. The Iron Mountain belonged to an original grant from the Spanish government, and the adjoining knoll was called "Little Iron Mountain." Six miles south was the Pilot Knob, the ores from which were well known in the Central West 25 years ago. The Iron Mountain first began to yield ore in 1845, when the American Iron Company was formed. In 1869 the Iron Mountain Company was organized to work the Iron Mountain mines exclusively, Pilot Knob being acquired by another company. On the ores from this district the iron industry of Missouri was based. In 1883 the number of blast furnaces in the State had reached its maximum, there being nine charcoal furnaces and eight coke furnaces. To-day the blast furnaces of the State consist of one coke furnace at South St. Louis, which has been using Iron Mountain and West Plains ores and one charcoal stack. For many years the shipments of ore from Missouri to other States averaged 100,000 tons, considerable quantities going to the Pittsburg and Wheeling districts by way of the Mississippi and Ohio rivers. The town of Iron Mountain in its prosperous days contained 6,000 inhabitants, but at present the number is scarcely 100.

A New Nutter-Barnes Cutting-Off Machine.

One of the principal changes in the No. 5½ improved metal saw cutting off machine built by Nutter, Barnes & Co., Boston, Mass., is the locating of the main spindle driving gears centrally, where formerly they were overhung on the ends of their shafts. These gears are all of 50 carbon crucible machinery steel forgings, solid on their shafts and supported between adjustable cap boxes, with provision for taking up wear between the shaft centers to prevent the saw from chattering. These gears have 4-in. face and are fully inclosed to protect them from chips and dirt in a casing, which is also an oil receptacle, so that the gears run in oil. The gear reduction from the driving pulley of the belt-driven machine, a front view of which is shown in Fig. 1, is 10 to 1. A rear view of a similar machine intended for motor drive is given in Fig. 2. In the latter the driving pulley bracket is removed and a back gear bracket substituted with gearing, which requires 40 turns of the cone pulley shaft to one of the saw spindle.

These machines are all equipped with oil pumps and piping systems to lubricate the saws; with large base drip pans to catch the chips and used oil, from which the oil is drained to a reservoir to be used over repeatedly.

The No. 5½ machine has a capacity for work up to 7 in. in diameter. The carriage is 22 in. long by 17 in. wide and has a movement of 12 in. The saw is 18 in. in diameter by 5-32 in. thick and is designed to run at about 13 rev. per min. A positive automatic belt feed is provided with eight changes from ¼ to 1 in. per minute. The stock support has adjustable screw elevation. The machine is very heavy and compact, weighing 2300 lb. and occupying a floor space of 2 ft. 6 in. by 4 ft. 8 in. When equipped with a high speed steel saw it is capable of doing a large amount of rapid, accurate and heavy cutting of steel of most any shape and size within its range.

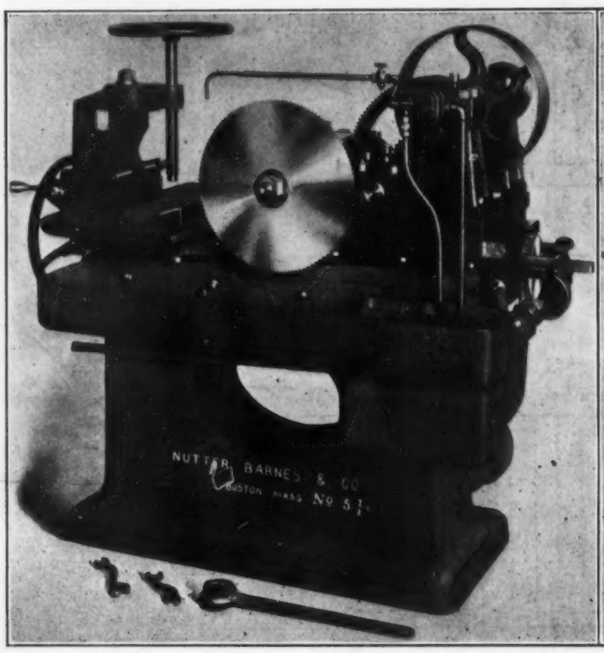


Fig. 1.—Front View of the No. 5½ Cold Saw Cutting-Off Machine Built by Nutter, Barnes & Co., Boston, Mass.

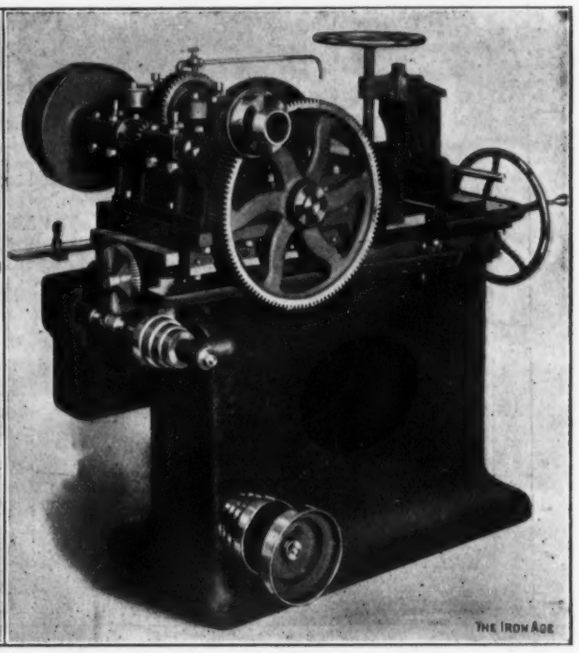


Fig. 2.—Rear View of a Similar Machine Provided with a Contained Countershaft for Motor Drive.

The Lloyd Metal Company is a new corporation which is to have headquarters at Houston, Texas, for the sale of iron and steel castings, and will deal in new and second-hand machinery, new and relaying rails and scrap metals. The company is capitalized at $10,000. W. H. Lloyd is president; W. H. Norris, vice-president, and Joseph H. Eagle, secretary.

The National Metal Trades Association.

With the possible exception of one plant the nine Indianapolis machine shops at which a strike was ordered by the International Association of Machinists on May 3 are now running with forces equal to their requirements and are all operating on the open shop plan. The strike was taken charge of by Robert Wuest, acting commissioner of the National Metal Trades Association, and the nine firms involved, none of which was previously a member of the N. M. T. A., participated in the organization of an Indianapolis branch of that association. Of this branch the six Indianapolis firms originally members of the N. M. T. A. and whose shops were not involved in the strike are also members. The demand of the men was for a minimum of 32½ cents an hour, with a flat advance of 2½ cents for all journeymen machinists. The strike at Lynn, Mass., the fight against which has also been in charge of Acting Commissioner Wuest, has resulted in favor of the employers. This strike was undertaken to force a demand for an eight-hour day and was the initial struggle of the Machinists' Union in its campaign for the shorter day. The seven firms involved, though previously outside of the N. M. T. A., were organized as a branch of the association. Owing to the conspicuous strength of labor unions in Lynn the contest was harder fought in some respects than that at Indianapolis, but with one exception all the shops involved are now running practically full.

Commissioner W. P. Eagan, who has been in the Southwest for some months in the hope of regaining his health, returned to the offices of the association at Cincinnati recently. He expects again to go to New Mexico in the near future.

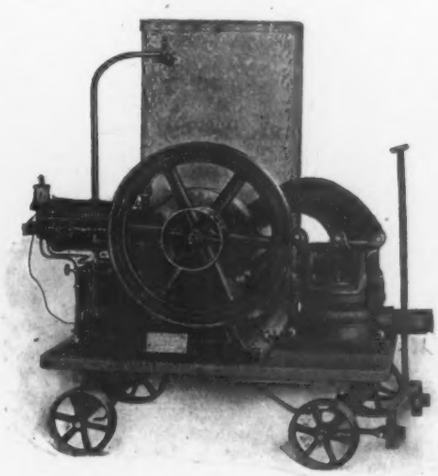
The next meeting of the Administrative Council of the association will be held at Cincinnati in October. This meeting will decide as to the time and place of the next annual convention. Twenty-one applications have just been secured at Syracuse, N. Y., for membership in a local branch of the N. M. T. A. which will be formed there. S. D. W. Cleveland will be local secretary. Heretofore the N. M. T. A. has had 13 members in Syracuse, so that the branch starts with a membership of 34.

A. C. Allen, who has heretofore been secretary of the Indianapolis Employers' Association, has been appointed secretary of the Indianapolis branch of the N. M. T. A., with office at 219 State Life Building.

The Carlin Portable Contractor's Pumping Outfit.

The value of hand power diaphragm pumps for handling dirty or gritty water in large quantities is so well established that it will readily be appreciated that one arranged for power drive, as shown in the accompanying illustration, would constitute a convenient, durable and economical pumping outfit. The outfit illustrated consists of a gasoline engine rated at 2 hp., a 3-in. suction diaphragm pump and a circulating water tank, all mounted on a small, substantially built four-wheel truck. This portable pumping outfit is now being placed on the market by the Carlin Machinery & Supply Company, Allegheny, Pa., and is designed especially for the use of contractors on foundations and sewers.

The Loud pump, used on this outfit, is of the rubber diaphragm type, which is not subject to cutting from dirt and grit, as is a cylinder pump, and is especially designed for this class of work. It operates by the raising or lowering of the diaphragm, displacing a certain amount of water at each movement, and rubber seated check



A Portable Gasoline Engine and Pump Built by the Carlin Machinery & Supply Company, Allegheny, Pa.

valves above and below the diaphragm cause the water to move in the forward direction only.

A 2-hp. horizontal, four-cycle gasoline engine supplies the motive power. The rating of 2 hp. is conservative, as the engine will develop more on actual test. A small feed pump attached to the engine delivers the gasoline to the glass cup or mixing valve, which serves as a sight indicator to the operator. The mixing valve supplies the explosive vapor in amounts proportional to the work done, the surplus gasoline returning to the tank through an overflow. The gasoline is entirely inclosed, eliminating danger of its explosion. The machine work is high class, the cylinder, piston ring, valve, &c., being accurately ground in, and cut gears used exclusively. The cast iron cylinder water jacket is removable, making it easy to repair in case of freezing through neglect. A pendulum governor controls the speed, which can be regulated while the engine is running. Large wearing surfaces add materially to the life and reliable operation of the engine.

The engine and pump are mounted on a light, durable hand truck, designed to insure stability and avoid the possibility of upsetting. A small circulating water tank completes the portable equipment. The regular size pipe or hose necessary is that conforming to a 3-in. suction, giving the outfit a capacity of 3000 to 4000 gal. of water per hour. The total weight of the outfit is 930 lb. A similar equipment is also furnished with a pump having a 4-in. suction, which is rated to handle 6000 gal. per hour.

In connection with pipe line laying the outfit is especially adapted for draining the trench. For testing the line a piston or pressure pump is added and so arranged that the two pumps are operated singly for either service—namely, draining the ditch or testing the line by water pressure.

The American Boiler Manufacturers' Convention.

Following is the programme of the approaching convention of the American Boiler Manufacturers' Association:

The convention will meet on the morning of September 18 at 10 o'clock in the Hotel Schenley, Pittsburgh, and will be called to order by Robert Munroe, Jr., chairman, who will introduce Mayor George W. Guthrie of Pittsburgh to make an address of welcome to the delegates. He will be followed on behalf of the Pittsburgh boiler manufacturers by Col. H. P. Bope, vice-president of the Carnegie Steel Company, and that address will be replied to by Col. E. D. Meier of the Heine Safety Boiler Company, New York City. The first session will adjourn at noon and at 1 p.m. the members and their ladies will be taken by special trolley cars to the foot of Wood street, where the steamer Island Queen will be boarded and the party taken for a daylight ride up the Monongahela River to allow a view of the Monongahela Valley, which is conceded to be the greatest manufacturing center in the world. The party will return at 11 p.m. and will be given a night view of the almost countless mills and furnaces in the valley when they are lighted up.

For the second day's session the convention will meet at 10 a.m. for the reading of papers and transaction of business. While this session is in progress automobiles will be provided to take the ladies for a ride through Schenley and Highland parks and the East End residence district. The ladies will be served with luncheon at the Country Club at 1 p.m. At 8 p.m. the delegates and their ladies will visit Luna Park, one of the chief amusement attractions in Pittsburgh.

The third day will be given over entirely to pleasure, the entire party taking a trolley trip around the belt line in Pittsburgh and will visit the Heinz pickle establishment in Allegheny, where luncheon will be served, the party returning to the Hotel Schenley at 5 p.m. At 7.30 p.m. a reception will be held in parlor A of the Hotel Schenley and at 8 p.m. the annual banquet will take place. Some noted speakers will be present, including Congressman John Dalzell, James F. Burke and Mayor Guthrie. A vaudeville entertainment will also be provided.

The American Boiler Manufacturers' Association extends a cordial invitation to all boiler manufacturers in the United States and Canada, whether members of the association or not, to attend this convention, which promises to be one of the most interesting ever held by the association. Any visitors desiring to remain in Pittsburgh after the sessions are ended will be taken care of by the local committee and will be given escort to any manufacturing plants or other points of interest in Pittsburgh that they may desire to visit.

The growing popularity of plunger elevators over the older types has given rise to a demand for special machines for boring the holes into which the plunger sinks. This is especially the case where plunger elevators are used in tall office buildings and for this service the Star Drilling Machine Company, Akron, Ohio, is manufacturing a special machine known as the No. 25 elevator machine. This machine, by virtue of special features in its design, is claimed to be superior to the ordinary types of churn drills for this class of work. The Star Drilling Machine Company reports that 31 of these special outfits have recently been sold.

The National Association of Cotton Manufacturers, successor to the New England Cotton Manufacturers' Association, will hold its eighty-first meeting at Hotel Champlain on the lake of that name on September 12 and 13.

The Ehrhardt & Sehmer Gas Engines.

In the production of large gas engines Germany without question leads the world. The pioneer work was done there, and nearly all of the large engines since built in other countries have been patterned after German designs or at least show their influence. In the issues of *The Iron Age* for June 22, 29, July 13 and 20, 1905, was printed a series of articles on "Large German Gas Engines," and the present article may be regarded in a sense as supplemental, since it deals with the work of another firm of notable German builders not referred to in the previous articles, Ehrhardt & Sehmer, Schleifmühle, near Saarbrücken.

Fig. 1 is a sectional elevation of a 525-hp. blast furnace gas engine recently delivered to the Cargo Fleet Iron Works, Southbank, England. The engine is of the double acting four-cycle type, with two cylinders in tandem, and is direct connected to a direct-current dynamo. The cylinders are 25 3-16 in. in diameter, and the stroke is 29½ in. At 150 rev. per min. the normal load of the engine is 500 b.h.p., while the maximum load is 600 b.h.p. With the last mentioned load, taking into consideration the diameter of the piston rod and assuming an efficiency of 82 per cent., the mean pressure in the engine is 71 lb. per square inch. Six days after the engine was first started it was given a 30 days' full load trial run and showed a very satisfactory performance.

It will be noticed that in its design the engine closely follows the lines of a steam engine. On account of the arrangement which allows the main parts of the engine to be concentrically fitted together the chief working stresses are evenly distributed and parallel to the main axis of the cylinder. Another advantage of this arrangement is the accessibility of all parts, which facilitates examining the engine and the proper working of its various parts. Great care has been taken to make it easy to clean or replace those parts which are liable to suffer from dust or dirt.

The engine in Cargo Fleet is an exact copy of a gas engine at the Government mines in Heinitz, near Saarbrücken, shown incompletely in the foreground in Fig. 2. This engine, working with coke oven gas of 500 to 560 B.t.u. per cubic foot, has been running day and night for nearly a year. The average load on the engine has been about 500 to 550 hp., while it has often carried 650 to 750 hp. for several hours. Although the engine has been running for such a long period it has not been cleaned since the day it was started. Even the cylinder covers have not been removed for inspecting the cylinders and pistons, and the engine still carries overload as easily and safely as when first started. A second engine of the same type, shown in the background of Fig. 2, but having four cylinders and giving 1200 hp., has been installed in the same power house, and began to work under full load four days after it had been started for the first time. Both engines, driving alternating current generators, are working in parallel with an existing steam plant.

Ehrhardt & Sehmer have already delivered or in hand 14 units of the same size, which is the smallest they have so far built. Of the six of these which are running five are working with coke oven gas and one with blast furnace gas. The firm builds gas engines of all sizes from 200 to 1250 hp. in one cylinder, so that the largest unit, a four-cylinder twin tandem engine, develops 5000 hp. The largest two-cylinder tandem engines built up to now are three with 45¼ x 51¼ in. cylinders, the maximum output of which at 90 to 94 rev. per min. is 2500 hp. The heaviest piece, the frame, weighs 40 tons. Fig. 3 shows a two-cylinder tandem gas blowing engine of the following dimensions: Diameter of gas cylinder, 32 11-16 in.; diameter of air cylinder, 88⅝ in.; stroke, 39⅜ in.; normal output at 100 rev. per min., 26,400 cu. ft. of air per minute against 7.1 lb. pressure per square inch.

The ability to carry an overload of about 20 per cent. above the normal output is a feature which is very important in the application of gas engines for driving blowers, especially blast furnace blowing engines, which

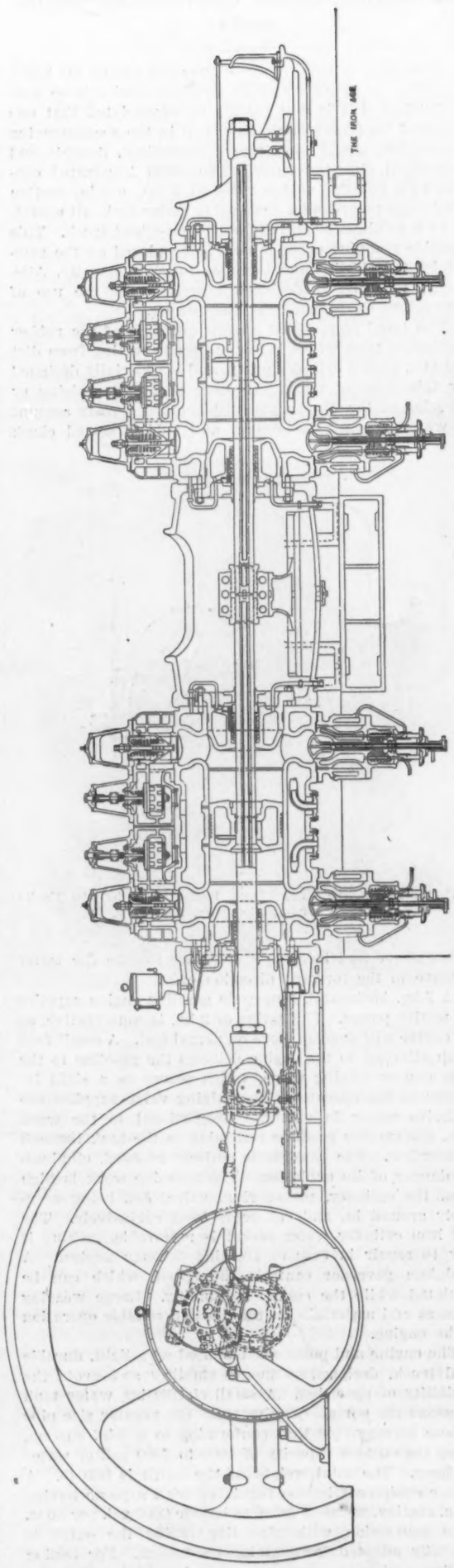


Fig. 1.—Sectional Elevation of a 525-Hp. Blast Furnace Gas Engine, Built by Ehrhardt & Sehmer, Schleifmühle, Germany.

unlike engines driving dynamos have to run most of the time with a heavy load. When the resistance in the blast furnace increases the wind pressure also increases, and it is a great advantage if the wind pressure can be

ning engine it has been the firm's aim to build high speed blowing engines. None of them run at less than 100 rev. per min., though most of these engines have 43-in. stroke. Such speeds are possible only with specially de-

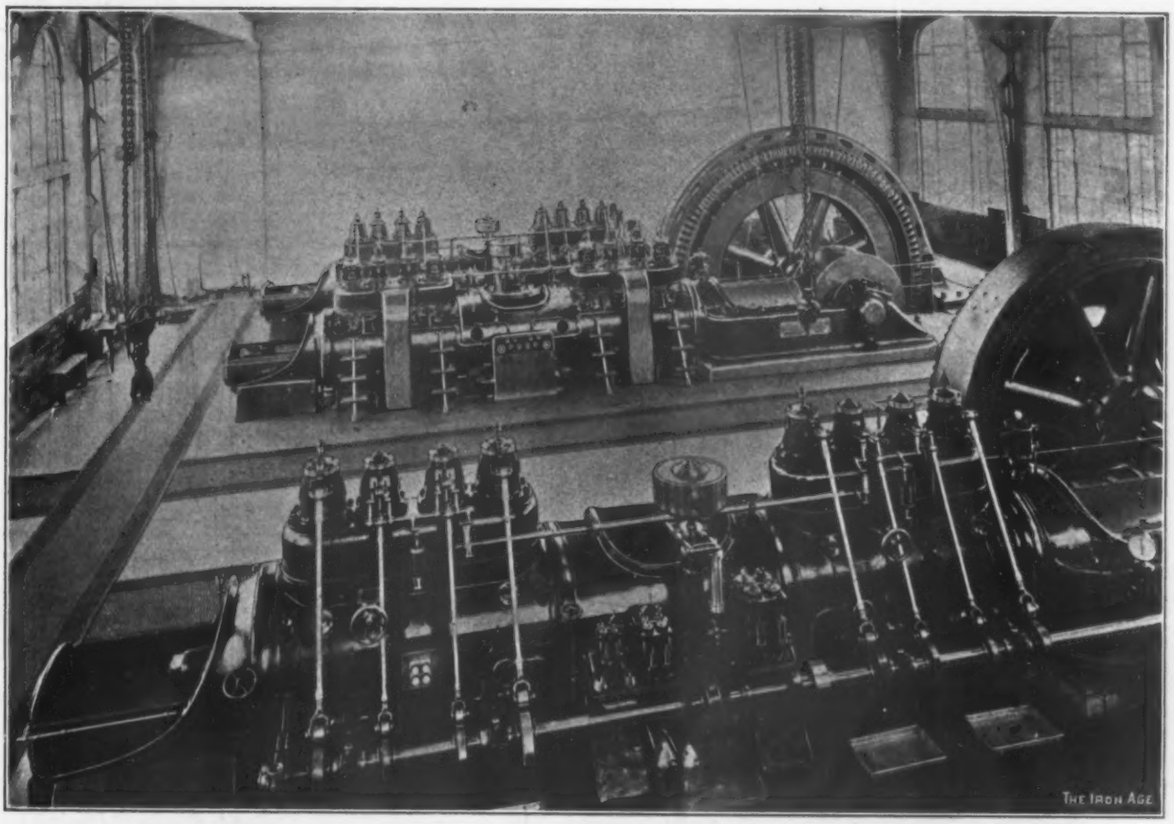


Fig. 2.—Ehrhardt & Sehmer Gas Engines at the Government Mines in Heinitz, Germany.

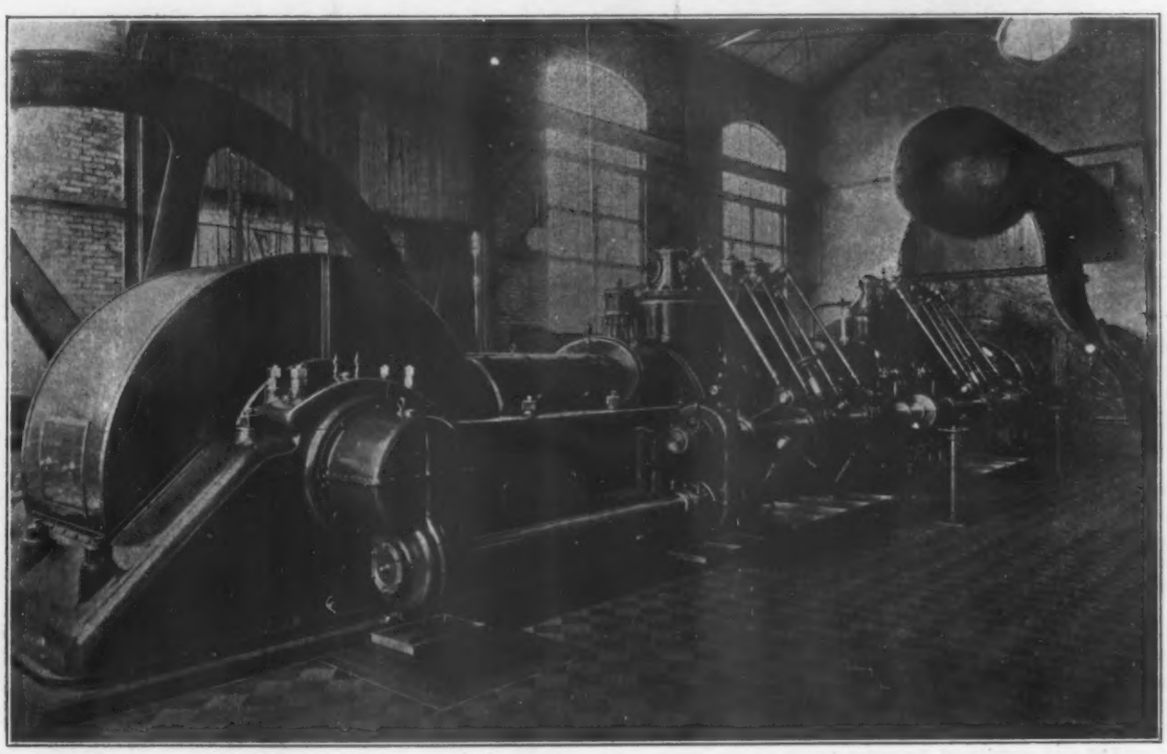


Fig. 3.—An Ehrhardt & Sehmer Two-Cylinder Tandem Gas Blowing Engine.

increased without reducing the quantity of air blown into the blast furnace. If the engine were not able to run with overload it would stop and the consequences would be serious.

As a high speed engine is cheaper than a slow running engine it has been the firm's aim to build high speed blowing engines. None of them run at less than 100 rev. per min., though most of these engines have 43-in. stroke. Such speeds are possible only with specially designed air valves, such as are shown in Figs. 4 and 5. These air valves have been tested at speeds from 120 to 200 rev. per min. and up to 71 lb. pressure per square inch.

To build absolutely reliable gas engines for powers

such as have been mentioned and secure their good working it is necessary in designing the various parts to take into consideration the stresses to which they will be subjected on account of the working pressures and the influence of heat. The stresses have to be carefully calculated, as they very often become greater on account of preignition, &c.

The cylinder being the most important element of the machine, calls for the greatest care and attention in its design and construction. The cylinder and water jacket are cast in one piece, so that some of the stresses on the cylinder walls are taken by the jacket. The water cooling space is usually large and all parts are made accessible, so that cleaning and inspecting are rendered easy. The cylinder covers are identical, back and front, and as the internal diameters of the distance piece, frame and back guide connection are larger than the flanges of the cylinder covers the latter can easily be moved along the piston rod, thus allowing inspecting or removing the piston at either end of the cylinder. It being very important that the cylinder should be a sound casting without internal strains great care must be taken in the foundry, not only to choose the right mixture of cast iron, but also in molding and casting the cylinder. An experienced metallurgist is employed to select the right brands of pig iron, &c., to analyze the various metals and the finished casting and to test the test bars cast with the cylinder. By a special method the finished cylinders are also tested under water pressure.

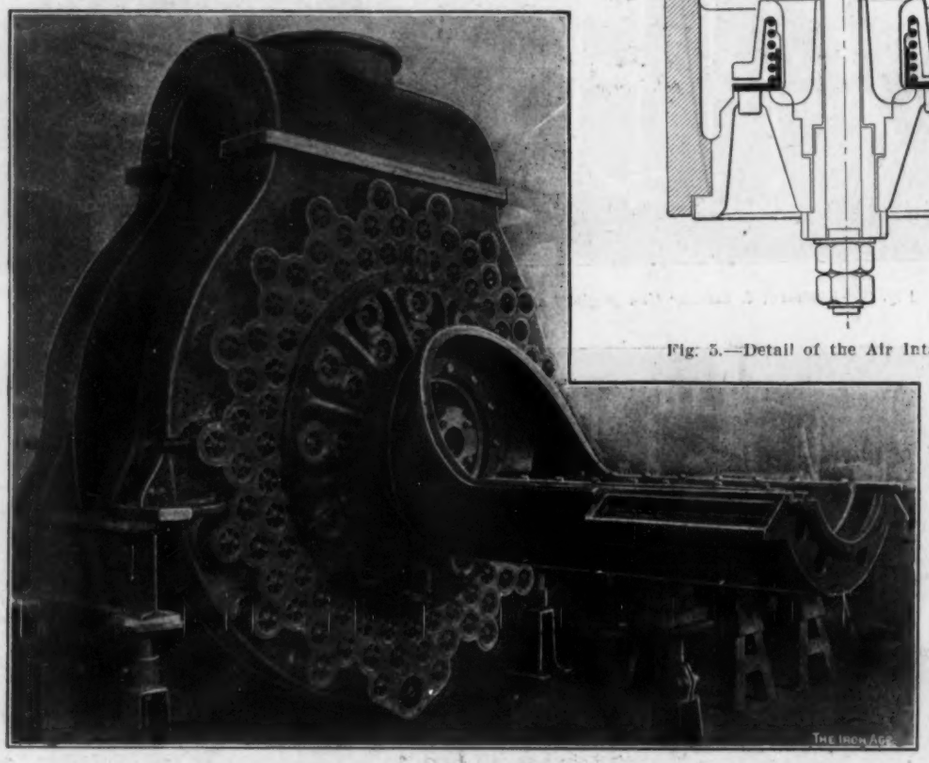


Fig. 4.—Air Valve Casting for a High Speed Gas Blowing Engine.

To prevent the cylinders from being worn by dirt or dust getting between the cylinder and the piston the friction between cylinder and piston must be minimized. Consequently the piston rod must be strong enough to carry the whole weight of the piston, so that only the piston rings press against the cylinder walls. The piston being cast in one piece is made as light as possible to prevent great deflection of the piston rod, which is guided and supported by cross heads in the frame, distance piece and the back guide. The effectiveness of this arrangement is indicated by a cylinder which had been working continuously day and night for a year and only showed a wear of 0.004 in. The stuffing boxes are fitted with white metal packing rings to keep them tight. The rings, which are free to follow the movements of the piston rod, are kept well lubricated and need no special attendance. The mixing valves, worked by a trip gear, are so designed that they work well even with dirty gas.

As soon as the engine on account of overload begins to run slower the valve gear admits a bigger charge to prevent the engine from suddenly stopping altogether. In a similar case other gas engines have the tendency to stop, unless the load is suddenly thrown off the engine, while the E. & S. gear causes the engine to recover as soon as the load on the engine is normal again.

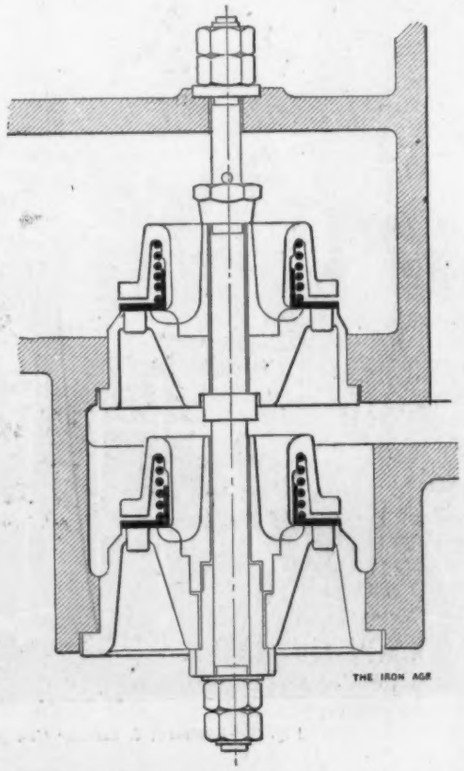


Fig. 5.—Detail of the Air Intake Valves.

A second order for England has been placed with these builders by Albright & Wilson, in Oldbury. This engine, which is to be driven by Mond gas, will have 37⅝-in. cylinders and a stroke of 43 5-16 in. At 105 rev. per min. it will develop 1300 hp. Although Ehrhardt & Sehmer only began to build gas engines in 1903 they have delivered or in hand engines representing a total of 50,000 hp.

The profits of the Colorado Fuel & Iron Company for the fiscal year ending June 30 are stated by a Denver dispatch to have been over $1,000,000. In the year ending June 30, 1905, the company showed a deficit of $341,992.

Marvelous Growth of the Iron Industry.

In his presidential address at the opening of the Iron and Steel Institute meeting in London, on July 24, R. A. Hadfield, Sheffield, England, presented some statistical statements calculated to show with what rapid strides the iron industry has gone forward in the United States since the first visit of the Iron and Steel Institute to this country in 1890. He also alluded to the splendid proportions of Great Britain's foreign trade. We make the following extracts from this portion of the address:

On an occasion like this one cannot but draw some comparisons between the present time and that when we first visited you. In 1890 America had commenced to pass us in its production of pig iron, making what must seem now the modest total of about 9,000,000 tons, we having made 8,000,000 tons. American imports and exports were then, I believe, about £300,000,000, against our £684,000,000. To-day your production of pig iron has increased to the enormous figure of about 23,000,000 tons [now 25,000,000 tons.—ED.]. You almost startle us with your proposals for the Gary plant, an expenditure of over £15,000,000, and 80 60-ton basic open hearth furnaces. I, for one, congratulate you most heartily, as in the advancement and prosperity of one country the world generally must benefit. In this expression of opinion English members of the institute will specially join me, as they know much of this remarkable progress has been brought about by members of your institute.

We, in our turn, have prospered not a little, for if this year our trade returns continue to expand, or even remain on the same footing as for the first six months, it is probable that the total trade of this country, imports and exports, will amount in 1906 to the gigantic total of not far short of £1,000,000,000 sterling—or, to express it "Americanly," $5,000,000,000. If our colonial and foreign exports, which are of course valuable and profitable, are included our grand total should be nearly £1,100,000,000 sterling. If exports represent the desideratum in the iron and steel trade, then, as that excellent American technical paper, *The Iron Age*, points out, in the first four months of 1906, as compared with 1905, Great Britain's exports of iron and steel have been considerably more than those of both the United States and Germany put together.

In face of these enormous figures on every hand one can but speculate upon the future. Prophesying before you know is always dangerous, notwithstanding Benner's remarkable record; but there is no doubt that in the not far distant future, unless some very important source of iron ore is discovered, we shall have to husband our ore supplies or iron may some day be as dear as, for example, copper.

In my presidential address last year I indicated that it was probable that by the year 1950 100,000,000 tons of pig iron would be produced annually, so that, as compared with 1800, when only about 5,000,000 tons were used, at least 300,000,000 tons of ore would be wanted annually. According to trustworthy authorities only about 10,000,000,000 tons of iron ore are available in known workable iron fields, yet by the end of the twentieth century a grand total consumption of probably 450,000,000 tons of ore a year will be called for. Whence are the supplies to come? If this probably serious position of affairs is applied practically to ourselves of to-day we realize that the man who makes 1 pound of iron go as far as 2 pounds now do is a public benefacator of the highest order.

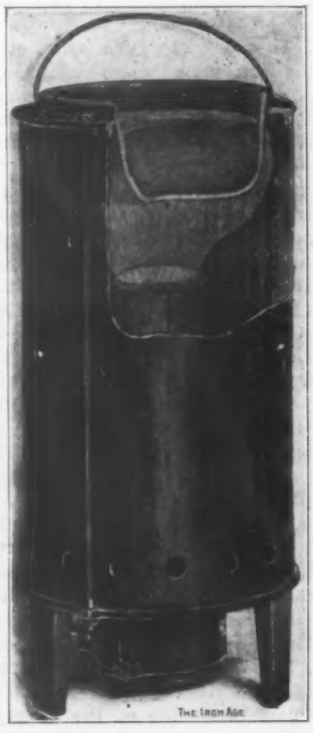
The world's production of pig iron has doubled in the short space of 15 years—that is to say, it has advanced from 27,000,000 tons in 1890 to 54,000,000 tons in 1905, approximately of the value of £160,000,000. We regard the production of gold as enormously important, yet the total value of the whole of this precious metal produced in the world last year—and it is well known—only amounted to £77,000,000.

Such colossal outputs of iron and steel demand colossal organizations, and therefore it is natural to find that you have now a company in America—the United States Steel Corporation—which has on its payroll nearly 200,000 employees, its distribution annually in wages being the sum of about £30,000,000. But what is this in a country which has over 200,000 miles of railroads and 150,000 locomotives?

The Busey Babbitt Melter.

A new type of gas melting furnace known as the Busey Babbitt smelter, for melting Babbitt, lead, solder and similar metals which fuse at low temperatures, is illustrated herewith. In this furnace the use of a fan blast or compressed air is entirely dispensed with, the type of burner used being so constructed that sufficient heat is developed without either. The air enters the burner tube at the base and is warmed by the radiated heat before mixing with the gas, producing an intensely hot blue flame which surrounds the bottom and sides of the melting pot.

The furnace itself consists of a sheet iron drum lined with fire brick, resting on a cast iron base, the whole being bolted together by vertical side rods. The melting pot rests on a cast iron ring, practically sealing the opening and precluding the loss of useful heat at the top of the furnace. Perforations in the casing permit the escape



Babbitt Melter Made by the Busey Burner Company, Baltimore, Md.

of waste gases and are so adjusted as to confine a maximum heat in the region of the melting pot. The claims for the melter are that it is particularly safe, convenient and economical, and that compared with other melters using gas a saving of 30 per cent. can be effected in the time of melting and the consumption of gas.

The size of furnace shown has a capacity of 50 lbs. per charge, and is especially adapted for use in machine shops, foundries and factories. Larger sizes for special work are also made. The furnace is manufactured and marketed by the Busey Burner Company, 23 Clay street, Baltimore, Md.

We have received through the courtesy of the Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, a communication by John Livingstone, in which he confutes statements relative to hollow staybolts which were contained in the report on flexible staybolts read at the recent Master Mechanics' convention at Atlantic City, N. J. Mr. Livingstone cites a large number of instances in which locomotives which were fitted with hollow staybolts 10 or more years ago are still in service, and gives other interesting points bearing upon the satisfactory performance of this class of staybolts.

The Mining Engineers in London.

LONDON, July 27, 1906.—With an occasional gasp to recover breath the members of the American Institute of Mining Engineers, who are in London as the guests of the Iron and Steel Institute, have valiantly stuck to the straining task of keeping abreast of the hospitality offered to them. While the largest single contingent reached England after a remarkably smooth voyage in the *Celtic*, other boats sailing before and after that vessel carried smaller parties, until about 125 members and their ladies were registered at the headquarters of the Iron and Steel Institute at Westminster. The thorough organization of the office of the Institute was admirably illustrated by the simplicity and efficiency of all the arrangements for handling the endless details connected with such a meeting.

Opening of the Joint Meeting.

A brilliant reception, given by the president of the Institute, Robert A. Hadfield, and Mrs. Hadfield, who is an American lady, opened the joint meeting of the two societies. It was held in the Grafton Galleries, which are admirably adapted for such a social gathering, and there were present about 900 members of the two societies and their friends. In one of the galleries an elaborate musical programme entertained many of them. Since the American Institute of Mining Engineers is making its second visit to England, and since the Iron and Steel Institute has twice crossed the Atlantic to the United States, the members of both bodies are united by many ties of personal friendship. While the absence of such men as the late Sir Lowthian Bell, Sir David Dale, G. J. Snelus and others was keenly felt, there were present many of the great leaders of the iron industry of England, like Sir James Kitson, J. Windsor Richards, E. P. Martin, Arthur Keen, Sir Hugh Bell, James Riley, William Whitwell, Arthur Cooper, David Colville, Andrew Lamberton, Sir Alfred Hickman, and from the Continent such men as Adolph Greiner of Cockerill, Belgium; C. P. Eugene Schneider of Creusot, France; Josef von Ehrenwerth of Austria and Dr. E. Schroeder of Germany.

The business of the meeting began on Tuesday morning with the general meeting of the Iron and Steel Institute, the plan being to hold one session by each society, followed by a third joint session. These gatherings are held in the main hall of the Institution of Civil Engineers, the greatest of the technical societies among English speaking peoples. It is a large hall acoustically admirable, with tiers of seats in semioval, facing a long semioval table at which are seated the officers of the society. The hall is a high one, lighted from above, the upper part of the walls being covered with life-size oil portraits of past presidents of the society. With the presidents of the two societies in the center and the two secretaries at their side, and every seat at the presidents' table occupied by members of the Council of the Iron and Steel Institute facing the large gathering, the sight was an impressive one, with that dignity which Englishmen know so well how to preserve.

Opening of the Formal Proceedings.

The proceedings were opened by Robert A. Hadfield, the youngest of the presidents of the Iron and Steel Institute. Mr. Hadfield is too well known in the United States to need an introduction. As the inventor of manganese steel, as a keen and brilliant investigator, as the managing director of one of the largest and most successful steel casting plants in the world, created by himself, he has won the distinction of being a Bessemer medallist, an honorary member of the American Institute of Mining Engineers and Master Cutler of Sheffield.

Mr. Hadfield offered a most hearty and cordial welcome to the American visitors. He reviewed the development of the American iron industry, and pointed out that England is continuing to prosper. It is probable that this year the total trade of Great Britain, imports and exports, will amount to the gigantic total of $5,000,000,000. He touched upon the question of the iron ore supply of the world and alluded to the vast scale upon which iron manufacturing operations are carried on in the United States.

Sir James Kitson, senior past president of the Iron and Steel Institute, in a happy speech seconded the welcome to the visitors. Captain Robert W. Hunt, president of the American Institute of Mining Engineers, responded.

After the announcement had been made that the King had signified his willingness to receive a deputation from the American Institute of Mining Engineers and had also accepted the Bessemer gold medal, as Queen Victoria had done, Sir Hugh Bell was introduced as the next president of the Iron and Steel Institute.

The meeting then proceeded to the reading and discussion of three highly important papers on gas engines: "The Design of Blast Furnace Gas Engines in Belgium," by Prof. H. Hubert of Liége; "British Practice in Large Gas Engines," by Tom Westgarth of Middlesborough, and "The Application of Large Gas Engines in the German Iron and Steel Industries," by K. Reinhardt of Dortmund, the last being particularly exhaustive.

In the afternoon there was offered a selection of four visits. One party visited the National Physical Laboratory at Teddington, a southwestern suburb. This institution, which is in charge of Dr. Glazebrook, was opened in 1901, for the purpose of standardizing and verifying instruments for testing materials and for the determination of physical constants. It is housed partly in an old mansion surrounded by gardens and green fields and partly in recently constructed shops. There are a number of departments, devoted to electricity, thermometry, meteorology, optics, engineering and metallurgy. The engineering department, which naturally most engaged the attention of the visitors, is well equipped with a series of special machines and apparatus. The corps is now engaged in an interesting series of experiments on the resistance of materials to alternating stresses and on researches on wind pressure and insulating materials. In the metallurgical department the tests on alloys which formed the basis of the Alloys Research Committee of the Institution of Mechanical Engineers, were carried out.

Another party visited the generating station of the London County Council at Greenwich, which when fully equipped will have a capacity of 52,000 h.p.

An exceptional opportunity was offered to the visitors to inspect some of the most famous of the halls of the city companies, or guilds—the Mercers, Armourers and Brasiers and Ironmongers. Admirably illustrated accounts of these halls were available to the members in a neat pamphlet entitled "A Keepsake of London," prepared by A. C. Meyjes, editor of the *Ironmonger*, which in a charming manner sketches all the points of interest thrown open to the American visitors. We quote from it the following concerning

The Ironmongers' Company.

"The Worshipful Company of Ironmongers in Fenchurch street ranks among the 12 'large' city companies, and was incorporated as far back as 1463, a generation before the discovery of America. Long before those days, however, it had existed as a voluntary brotherhood of members of the iron trade; in fact, there is a reference to ironmongers in the city records of as early a date as 1300, when the *Ferones*, or dealers in iron, complained to the authorities that the smiths of the wealds were supplying irons for cartwheels of much shorter length than ancient usage allowed. Whereupon certain ironmongers bearing the lordly names of Robert de Paddington and John de Wymondcham were empowered to seize any offending irons. The company has more than once been concerned in 'plantation' schemes on a small scale, and it is on record that in the reign of James I, with other companies, it took part in a scheme for colonizing Virginia 'to ease the Cittie and suburbs of a swarme of unnecessarie inmates as a continuall cause of dearth and famine, and the verie origenall of all plagues.' Another plantation scheme, in Ireland, brought to the company the Manor of Lizard, near Coleraine, hence the Lizards which serve as supporters of the company's coat of arms. The site on which stands the present hall was purchased by 19 ironmongers, members of the guild, in 1457, and the building then erected, to which a large garden was attached, lasted until 1585, when it was rebuilt. The

present hall is the third, and dates from 1748. It cost £5,000. The banqueting room, which is 70 ft. long and 29 ft. wide, has a paneled dado 8 ft. high, bearing in its upper compartments the arms in proper colors of the past masters of the company from 1351. The seven windows, as seen from the street, are all of different styles, and the walls are adorned with the portraits of 13 eminent 'ironmongers' of past days. Twenty Lord Mayors of London have been members of the Ironmongers' Company, the first of these being Sir Richard Marlow, in 1409. The company has a fine collection of plate, including two beautiful fifteenth century 'mazers' or maplewood drinking vessels, of a kind of which only 50 examples are known to be in existence. The company owns considerable property, partly bequeathed to it in the fifteenth and sixteenth centuries, the revenue of which is mostly applied in the distribution of charity."

SOME PAPERS AND DISCUSSIONS.

Blast Furnace Gas Engines in Belgium.

The paper by Prof. H. Hubert, Liége, Belgium, on "The Design of Blast Furnace Gas Engines in Belgium," told of the first efforts of the Cockerill Company in designing engines to use blast furnace gas. Patents were taken out on May 15, 1895, and the first trials were made with a simplex engine of 8 hp., in which it had only been sought to reduce the clearance space, in order to increase the compression and to facilitate the ignition of the mixture. The gas cleaning was very imperfect, and was carried out simply by passing it through two scrubbers, 4 m. in hight. This engine displayed perfect elasticity and adapted itself to the variations of composition, pressure and temperature of the gases, giving an efficiency of 77 per cent. At that time a plant producing 100 tons of pig iron per day was able to furnish about 18,000 cu. m. of gas per hour with a calorific value of 1000 calories. Considering that half this volume is available and allowing for an efficiency of only 20 per cent. in the engines it was shown that it would be possible to obtain from these gases about 3000 hp. The paper then went at some length into a discussion of the experiments of the Cockerill Company and its improvements in the design and construction of blast furnace engines. Much of the ground covered is familiar. The latest experiments referred to are those of detailed tests on the 1400 hp. and two cylinder double acting and tandem engine installed in the electric service of the Cockerill Company. These tests were made on January 9 and 10, 1906, by Professors Hubert and Witz. The detailed results of these tests will be published later. The author gives the following table, however, which indicates the progress made since the first use of blast furnace gases in blowing engines and in engines driving electrical equipment:

No.	Description.	Date of trials.	Power. I. H.P.	Power. B.H.P.	Consumption of gas. I.H.P.	Consumption of gas. B.H.P.	Consumption of heat. I.H.P.	Consumption of heat. B.H.P.	Thermal efficiency. Per ct.
1.	8-hp. engine	1896	5.26	4.0	4.03	5.30	4,030	5300	15.77
2.	260-hp. engine. Single cylinder, single acting, constant admission	July 19-20, 1898	213.9	181.82	2.830	3.329	2,775	0.83625.7	22.9
3.	600-hp. engine. Single cylinder, single acting, constant admission	March 20, 1900	825.8	670.0	2.560	3.156	2,520	0.13106.8	25.2
4.	200-hp. engine. Single cylinder, single acting, variable admission	December 2, 1901	246.9	215.3	2.981	3.418	2,766	3172	23.0
5.	1,400-hp. engine. Double acting, tandem, variable admission	January 9-10, 1906	1,755.06	1,581.9	2.155	2.392	2,129	0.12363.3	29.84

In comparing the trials of 1906 with those of 1900, which gave results considered excellent at the time, there appears a diminution of 15 per cent. in the calories used per horsepower. For the brake horsepower the reduction amounts to 31 4-10 per cent. The increase in thermal efficiency represented by the difference between 25 2-10 and 29 84-100 has been 18 4-10 per cent.

The advantage obtained as compared with the employment of steam is important. The author says: "Admitting that a 70 per cent. efficiency is obtained by burning the gases under boilers, which is considered satisfactory, and that the steam raised amounts, according to Carnot's cycle, to an efficiency of 40 per cent. (between 200 and 10 degrees, which the cycle of Rankine makes 77 per cent. of that of Carnot), and finally that one could succeed in obtaining 80 per cent. of the Rankine cycle, the thermal efficiency becomes

$$0.70 \times 0.40 \times 0.77 \times 0.8 \times 100 = 17.25,$$

which is lower, by 42 per cent., than that of the motor above described.

"It has been assumed that a blast furnace producing 100 tons of pig iron per day produces about 9000 cu. m. of gas at 1000 calories, available for the production of power. Under these conditions, by obtaining 2450 hp. with the steam engine, and 4220 by using the gas direct in gas engines, there remains a difference of 1770 hp. in favor of this new application over the results obtained by a first-class steam plant of the usual (boiler) type. These figures explain the success obtained in metallurgy by the direct use of blast furnace gas."

The paper refers to the increase in the size of units as the Cockerill engine has been developed. The earlier orders, which were for single cylinder engines, did not go above 800 hp. Later orders for tandem engines or for the single cylinder double acting type run up to 1600, 1800 and 2000 hp. The total of Cockerill engines ordered for blowing and electrical service is 63,155 hp. Besides the Cockerill Company one other, the Société de Saint Leonard, has undertaken the construction of blast furnace gas engines in Belgium. This latter company has acquired licenses for the construction of the Körting two-cycle double acting engine and is installing two engines of this type at the blast furnace of Grivegnée.

Large Gas Engines in the German Iron and Steel Industry.

K. Reinhardt's (Dortmund) paper, entitled "The Application of Large Gas Engines in the German Iron and Steel Industries," goes voluminously into the subject. The objects of the paper are stated to be to show the extent of the use of gas engines at ironworks and collieries in Germany, to show the working results, including the influence of purification, also the present practice in the design of large gas engines. The author sent inquiries to the various iron and steel works and coke works, and the answers to these furnished much of the material for the paper. It was ascertained that of the 49 German smelting works questioned, 32 had already gas engines at work and 9 had ordered such engines. The author shows that there are at work or in contemplation 349 engines, with a total effective horsepower of about 385,000. Of this number 69 have about 34,000 hp. and are of older construction, with single acting four-cycle motors; 88 have about 91,000 hp., with two-cycle motors, and 197 have about 260,000 hp., with double acting four-cycle motors. Between March 1 and July 1 this year 31 engines were ordered, of about 36,150 hp. Of the 349 engines at work, under erection or ordered, 136, with 161,300 hp., will drive blowing engines—103,000 hp. of double acting four-cycle motors; 50,100 hp. of two-cycle motors, and 8200 hp. of old form single acting four-cycle motors. For driving dynamos there will be at work 199 engines of 206,100 hp.; for driving rolling mills, 10 engines of 16,100 hp., and for other purposes 4 engines of 1500 hp.

The largest aggregate power of gas engines at a single works amounts to 35,000 hp. Sixteen works possess over 10,000 hp., and 27 works possess over 5000 hp. in actual working. In most ironworks the whole of the gas engines work continuously without any reserve; a few have up to 40 per cent. reserve of gas engines, and a few have a similar reserve of older types of steam engines or steam turbines. Nearly all engines in ironworks naturally work with blast furnace gases. Two plants use only coke

oven gases, three use blast furnace gas and coke oven gas separately, and one plant uses the two gases mixed. One company utilizes the waste gases from the copper smelting furnaces for driving gas engines. Producers employing coke as fuel are kept as a reserve at seven works. The author remarks that the application of gas engines in collieries is much less important, due to the fact that the heat given off by the older type of coke oven can only be utilized under steam boilers, and consequently for these older plants steam boilers are inevitable in collieries. At the beginning of March this year 16 collieries had 35 gas engines at work, in course of erection, or on order. The aggregate effect of all these engines was 33,300 hp.

The author says that from what has been learned up to the present time, it is clear that a thorough purification and drying of the gas is undoubtedly the principal factor in assuring a continuous and undisputed working of gas engines. German gas engine manufacturers have from the first considered the cleaning of the gas an essential condition, while, on the other hand, the Cockerill Company considered it unnecessary. He mentions a number of points which may be observed in following a standard type of purifying plant for blast furnace gas, details the parts of the Theisen apparatus and the manner of working it, describes other methods of purification, discusses gas cleaning fans and the Bian cooler. The purification of coke oven gas for utilization in gas engines is also considered and some results given of the influence of purification.

From the information supplied by the ironworks only the total result can in most cases be reviewed; however, in a few cases the result of the cleaning by each apparatus is given, and from this the author concludes that a single Theisen apparatus cleans better than a single fan, since with the former the proportion of cleaning is between 90 : 1 and 25 : 1, with about 6.5 effective hp. per 1000 cubic meters, and with a fan the proportion is about 12 : 1 and the average effective hp. 2.3. From two fans, one placed behind the other, a proportion of cleaning from 50 : 1 to 200 : 1 and power employed from 6.5 to 10 effective hp. per 1000 cubic meters per hour has been attained. Without taking the consumption of water into consideration, one Theisen apparatus is approximately equal to two fans.

Of 15 collieries questioned, two had no special plant for the purification of the gas, but only plant for the recovery of the by-products; four collieries have plant for the separation of sulphur and tar, six a similar plant for sulphur only, and three a plant for tar only. The power expended is only that necessary to overcome the resistance of the gas passing through the purifier, which is on an average about ¼ per cent. of the power developed. The other working expenses consist only of the renewals of the filtering material, which amounts on an average to about 0.03 pfennig per cubic meter; while the expenses of the purification plant itself increases greatly with the sulphur in the gas.

Proceeding to describe the present design of large gas engines in Germany, the author remarks that from the answers received from the ironworks and collieries it may be concluded that the old arrangement of the single acting four-cycle motor, with one or more cylinders, has in recent years not been generally used, and that, on the other hand, double acting four-cycle motors, mostly with tandem cylinders, are in keen competition with two-cycle motors. Of the 29 firms in Germany building large gas engines 21 build double acting four-cycle engines, five build two-cycle engines and three build both. The various parts of the different types are described in detail. The two-cycle engine is considered less adapted for the high speeds required to drive dynamos, while they are without doubt more suitable for driving blowing cylinders. Tests as to consumption of gas in more recent engines are not available for comparison, therefore it is not known how far the two-cycle engine is at the present time in this respect still inferior to the four-cycle engine.

Large Gas Engines in Great Britain.

The paper by Tom Westgarth, Middlesbrough, entitled "Notes on Large Gas Engines Built in Great Britain and Upon Gas Cleaning," gives schedules of the number, type and horsepower of gas engines of large size which have been built or are building at works of British makers. Comparatively few of these engines—four, to be exact—will use blast furnace gas. Three will use coke oven gas. The remainder will use gas from various types of producers. The list includes the Oechelhäuser engines built or building by William Beardmore & Co., Glasgow (28 engines, total 32,600 i.h.p.); the Körting type by Mather & Platt, Manchester (six engines, total 4875 i.h.p.); those of the Premier Gas Engine Company, Nottingham (28 engines, total 16,950 i.h.p.); of Willans & Robinson, Rugby (two engines, total 1800 i.h.p.); of Crossley Brothers, Manchester (33 engines, total 19,360 i.h.p.), and of the Cockerill type built or building by Richardsons, Westgarth & Co., Middlesbrough (22 engines, total 20,500 i.h.p.). These total 119 engines, aggregating 96,085 i.h.p. Restricting the mention of engines to those of 500 hp. and above, the author has excluded many of several other firms which do not reach this power. He alludes to the fact that all the British builders of large gas engines are using the "four-cycle" system, except the builders of the Körting and Oechelhäuser engines, who work upon the "two-cycle" system, and that large gas engines are gradually coming into use in Great Britain for general purposes—*i.e.*, in addition to blowing and dynamo work they are being applied to rolling mills, and for general manufacturing purposes, cotton mills, cement works, &c. In conclusion the author refers to the cleaning of gas, mentioning several types of gas cleaning apparatus. He adds: "Most engineers commenced cleaning the gas for engines by passing it through ordinary fans with water. It was soon found that two or more fans in series would be necessary and that a considerable quantity of water and much power were required, the result not always being satisfactory, particularly if the gas had not previously been very well cleaned and cooled by passing through large dust catchers and long mains. A difficulty also occurs with the moisture absorbed by the gas in the fans, and it has been found necessary to supplement the fans by various cleaning and drying devices."

Discussion on Blast Furnace Gas Engines.

A. Greiner said that at the Cockerill works they had built 63 engines giving 63,000 hp., and that other companies working under licenses had built 113 engines of 103,000 hp. As against the original calculation given by him in a paper presented to the Institute eight years ago, namely, 3,000 hp. for a blast furnace making 100 tons of pig iron, Professor Witz and Professor Hubert had shown that the new engines take 3800 hp. out of the gas. At present 700 to 800 tons of pig iron a day is made at the Cockerill works, and they hoped to have 26,000 hp. in gas engines in a few years as against only half that at present. Referring to gas cleaning, he thought that Mr. Theisen was wrong in saying that the warmer air is on entering the apparatus the better results it gives. Air must go into the Theisen apparatus and other centifugal apparatus as cool as possible, the reason being that when air is heated it becomes more saturated with steam or vapor, and the more vapor in the air the more dust. It was possible to remove 4 or 5 g. of dust as well as 2 or 3 g., but after a few days or weeks the apparatus would become so full as to be difficult to clean. Therefore the cooler the air on entering the apparatus the better.

Mr. Westgarth desired to emphasize one point. He feared that a good many of those connected with iron and steel works exaggerated the difficulty of getting gas engines to work properly because of imperfect cleaning of the gas. He noticed that the paper on German practice stated that gas was cleaned down to 0.02 g. per cubic meter. The Theisen apparatus aserected by the speaker's company had cleaned ordinary blast furnace gas to 0.0025, which was probably as clean as the room in which they were meeting, or even cleaner, as they happened to be in London. He thought it should be well understood that the great initial difficulty in cleaning the various waste gases for gas engines had been overcome.

Julian Kennedy, Pittsburgh, said that while the United States was only making a beginning with the use of blast furnace gases in gas engines, it was appreciated

that the chief consideration is an easy and thorough method of cleaning gases. The Lackawanna Steel Company, the only American company with any large experience with blast furnace gas engines, had trouble at the start, as was to be expected, but it is now making a great success, and the feeling is that the era of gas engines using waste gases is just upon the American iron industry.

William Kent believed that what is wanted in connection with the utilization of blast furnace gases is a governing apparatus, as suggested in Herr Reinhardt's paper. Auxiliary producers are already in use to make up for the irregularity in demand. In the future, according to the speaker, there will be near large cities gas engine plants supplied with gases from blast furnaces, and these would supply electric light and electric power to the cities. There would be a plant in reserve composed of gas producers, but supplied directly with bituminous coal.

E. J. Duff mentioned the fact that the 28 gas engines tabulated in Mr. Westgarth's paper, with a total capacity of 32,600 i.h.p., are working some form of Duff gas producer. One English firm has built, or is building, producers of a total capacity of 100,000 hp., all of which clean gas and recover from it by-products in sufficient quantity to pay the entire coal bill.

James Hamilton said that British gas engines had not developed along quite the same lines as German engines. The latter had been designed chiefly with a view to increasing the power and not much with a view to increasing economy. The four-cycle engine is certainly more economical than the two-cycle engine, but that is not altogether the reason for its adoption in Germany and Belgium. In England a greater amount of work is done with producer gas than with blast furnace gas, consequently the English engines have been developed rather with a view to economy. In a blast furnace gas engine the saving as compared with the steam engine is about 5 to 1. In the producer gas engine it is not so much, since there is a deduction from the efficiency of the producer.

The discussion was further participated in by A. T. Tannett-Walker, Mark Robinson, Professor Turner and B. H. Thwaite.

American and Foreign Rail Specifications.

The paper of Albert Ladd Colby, entitled "Comparison of American and Foreign Rail Specifications, with a Proposed Standard Specification for American Rails Rolled for Export," was given in synopsis in *The Iron Age* of August 2, and Mr. Colby's proposed specification was printed in full. In opening the discussion Windsor Richards spoke of the phosphorus specification as of most importance. For many years British rail manufacturers had agreed to supply steel which would not contain above 0.06 per cent. phosphorus. Iron ores now are not so low in phosphorus as formerly, and the manufacturers had taken up with a subcommittee of the various engineering societies the proposition to advance the phosphorus limit to 0.08 per cent. This had been discussed at a number of meetings, but the request was refused, the maximum allowance of British engineers being 0.07.

F. W. Harbord said that if the position in respect to ores in the United States was such that 0.10 of phosphorus is the minimum that manufacturers could well give in rail steel, it was reasonable that a change should be made. In England rail manufacturers without great trouble could work regularly to a specification of 0.08 in phosphorus, which he considered more reasonable than 0.07. In the United States, with the basic open hearth rail coming into use, there should be no difficulty in making rails 0.08 in phosphorus or less. More prominence should be given to the carbon specification in the speaker's opinion. Moreover, basic open hearth steel is softer than acid open hearth steel of the same carbon content. It would be possible therefore to have a higher carbon with lower phosphorus if basic open hearth rails were made.

Referring to the table presented by Mr. Colby, giving records of American rails which had not broken, though containing 0.10 per cent. of phosphorus, Mr. Hadfield asked as to the remaining constituents. If the carbon were very low the percentage of phosphorus might possibly be increased to the point suggested, but unfortunately the higher the carbon the higher the phosphorus and the more risk in increasing the phosphorus limit.

Dr. Raymond read from a criticism of Mr. Colby's paper contributed by E. F. Kenny, engineer of tests of the Pennsylvania Railroad. Mr. Kenny said that convincing testimony had been furnished to both the American Society of Civil Engineers and the American Railway Engineering and Maintenance of Way Association that nearly every railroad in the United States having heavy traffic is suffering greatly from broken rails. The attempt to improve the wearing quality by making the rails harder results in a crop of brittle rails due to high phosphorus. The writer thought there was little likelihood of getting rails well heated and finished under the specification proposed by Mr. Colby. Reference was made to the absence of any restriction on finishing temperature. Recent American specifications all fix a maximum shrinkage allowance, but it is being steadily opposed by the manufacturers. The defects of many broken rails can be traced to injuries received in straightening. The absence of restrictions on this point the writer considered unfortunate.

J. E. Stead thought it would be a mistake to make the phosphorus specification 0.10, as it is desirable that the average should be not more than 0.07 or 0.08. If the other elements are not very high then 0.10 might even be allowed. The speaker believed that high manganese caused more broken rails than phosphorus, high manganese and high carbon being very treacherous.

Mr. Colby said that it seemed to have been overlooked in the criticism of his phosphorus specification that he recommended an impact test, which is certainly a reliable check on brittleness. Moreover, he had followed the British preference by specifying a lower carbon than is customary in the United States. As to the criticism that a definite percentage of top discard should be specified, he believed that this would not accomplish the object intended—namely, the entire absence of piping. He quoted from H. H. Campbell, who had said that the only way he knew of regulating the discard so as to prevent piped rails was to cut the rail bloom in two and throw both pieces away.

The Roe Mechanical Puddling Process.

The discussion on the paper of James P. Roe, Pottstown, Pa., entitled "The Development of the Roe Puddling Process," was opened by Dr. Raymond. The substance of the new development in his process as presented by Mr. Roe in this paper was given in an editorial in *The Iron Age* of August 2. Dr. Raymond referred to the growing complaint of poor wearing qualities of certain forms of finished steel, particularly steel wire. The question of corrosion was one which steel manufacturers would have to face and in this connection the revival of the puddling furnace was a matter of special interest.

Axel Sahlin told of his inspection while at Pottstown of the Roe mechanical puddler and of its surprisingly good work. He had seen charges consisting of about 3600 lb. of molten iron turned into one solid ingot weighing somewhat more than the iron charge, this being done in 38 min. from the time the machine was started until the huge puddle ball automatically rolled into the squeezer. In order to produce high-grade material in wrought iron, specifications for material should be drawn up as strictly as for steel, and this the necessity to manufactur cheaply had hitherto prevented. If now excessive labor cost is brought down and the heterogeneous quality of the pile is changed into the uniform composition of an ingot not even subject to the changes wrought by segregation; if, further, the heavy puddled and reheated loss is turned into a gain in weight from addition of cinder and roll scale, then the main reason against the use of wrought iron in preference to steel falls to the ground, while all the old arguments for the use of iron are strengthened. Care is taken to specify wrought iron for corrugated sheeting exposed to the weather. In England they preferred pipes and tubes of wrought iron to those of steel. They recognized that in ships, fence wire, nails, tinplates, in fact, whatever is exposed to corrosion more than to heavy stresses, wrought iron is better than steel. With improving quality they would recoguize new advantages, and

the use of the iron would grow, not at the expense of steel, but alongside of it.

E. S. Cook, of the Warwick Iron & Steel Company, Pottstown, Pa., which had furnished direct metal for Mr. Roe's experimental furnace, said that the first work of the furnace was not satisfactory from the standpoint of regularity and uniformity of the metal, but Mr. Roe had overcome this difficulty notwithstanding that the furnaces gave him iron of a varying composition. For instance, they ran the iron into ladles on cars, and when Mr. Roe happened to call for a carload it might be 3 per cent. of silicon down to .02 of sulphur; and the next time he came he would find the iron with one-half of 1 per cent .of silicon in it, and it might have sulphur of from 2 or 3 per cent. to one-tenth. The finished metal seemed to be about the same when he examined the Roe product. It would seem to him, as Mr. Sahlin had stated, that it was a matter of the utmost importance to blast furnaces to have an outlet for iron that was not suitable for the basic or the Bessemer processes, and there was the fact also that there was an increased demand for a material that would stand corrosion.

Professor Bauerman, London, said with reference to the rotary furnaces, which were spoken of in the past tense everywhere, that they were not entirely dead; in fact, he saw one less than three months ago working very satisfactory at Terni, in Italy. That was not the original Danks furnace, but the one that was known as the Bouvard modification, which was developed at Creusot, and which did away with the defects of the original Danks furnace. The author of the paper proposed not merely to give them the original Danks bloom, but one of double the weight. He was rather doubtful as to the propriety of that. He could not help thinking that for wrought iron making more manageable masses are wanted, especially as in wrought iron uniformity of make is desired.

June Iron and Steel Exports and Imports.

The report for the month of June, which has just been issued by the Bureau of Statistics of the Department of Commerce and Labor, enables the complete figures to be given of exports and imports of iron and steel for the fiscal year which ended June 30, 1906. Excluding iron ore, the total value of the exports of iron and steel and manufactures thereof for this period was $160,984,985, representing the highest figures attained in this branch of our export trade in the history of the country. Similar exports for the fiscal year 1905 reached a value of $134,728,363, while for 1904 the total was $111,948,586. The value of exports for June, however, fell somewhat below the figures for May, the totals being respectively, $14,085,003 and $15,686,322. Taking the commodities for which quantities are given, the following table shows the exports for June and for the 12 months ending with that month in 1906 and 1905:

Exports of Iron and Steel.

	June,		Twelve months.	
	1906.	1905.	1906.	1905.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	6,641	1,390	59,509	56,971
Scrap	917	716	10,241	19,710
Bar iron	4,065	1,775	42,763	32,323
Wire rods	296	864	6,482	15,738
Steel bars	2,540	932	22,530	24,167
Billets, ingots, blooms	17,281	9,703	273,272	236,155
Hoop, band, scroll	323	278	5,042	3,029
Iron rails	....	.....	.....	78
Steel rails	25,996	22,340	345,826	409,429
Iron sheets and plates	1,413	926	10,278	5,557
Steel sheets and plates	6,590	8,879	78,149	70,991
Tin plates and terne plates	1,173	815	11,592	10,264
Structural iron and steel	11,719	4,997	97,668	73,287
Wire	15,515	12,534	164,253	126,190
Cut nails	724	1,583	6,868	9,101
Wire nails	3,392	3,540	44,568	36,856
All other nails, including tacks	291	233	4,332	3,735
Pipes and fittings*	8,709	....	147,497	....
Totals	107,585	71,505	1,330,870	1,133,581

* Quantity not stated prior to July 1, 1905.

It will be observed from the above table that the exports in June of such commodities aggregated 107,585 gross tons. The May exports of similar commodities were 136,592 tons, April, 120,015 tons; March, 138,679 tons; February, 97,719 tons, and January, 109,506 tons. The total for the fiscal year just ended was 1,330,870 tons, as compared with 1,133,581 tons in the previous fiscal year. The increased tonnage over the fiscal year 1905, however, was more apparent than real, as the figures for the last fiscal year include the weight of pipes and fittings, not separately given for previous periods.

The month of June showed a slight increase in the value of iron and steel imports, the figures for this month, exclusive of iron ore, being $2,897,622 against $2,859,492 in May. The imports of commodities for which quantities are given amounted in June to 41,038 gross tons against 45,706 tons in May, 37,920 tons in April, 50,167 tons in March, 28,407 tons in February and 46,516 tons in January. The imports of these commodities for June and for the 12 months ending with that month in 1906 and 1905 were as follows:

Imports of Iron and Steel.

	June,		Twelve months.	
	1906.	1905.	1906.	1905.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	22,906	17,117	271,790	122,977
Scrap	490	1,669	25,810	12,650
Bar iron	4,351	4,090	37,817	26,669
Rails	389	8,277	9,635	17,025
Hoop, band and scroll	260	232	11,197	1,918
Billets, slabs, bars, &c., steel in forms n.o.s.	2,275	910	19,643	9,800
Sheets and plates	679	231	3,297	2,108
Tin plates and terne plates	4,458	5,416	53,937	71,905
Wire rods	2,146	1,514	18,495	15,282
Wire and articles made from	544	258	4,623	3,851
Structural iron and steel	2,464	619	35,598	3,157
Chains	26	31	311	278
Anvils	50	21	243	176
Totals	41,038	40,385	492,396	287,796

The total value of imports of iron and steel, not including ore, for the fiscal year 1906 was $29,053,987 against 23,510,164 in the previous fiscal year.

The imports of iron ore in the fiscal year just ended were 981,026 gross tons, against 757,323 tons in the previous fiscal year. The exports of iron ore for the past fiscal year were 227,378 gross tons, against 261,669 tons in the previous fiscal year.

Sheffield Steel in the United States.— Chiefly due to larger business in high speed steels, the exports of Sheffield steel to the United States increased from £127,493 in the first quarter of this year to the record total of £150,077 in the second quarter. For the June quarter of 1905 the total was £93,973 and in the corresponding quarter of 1904, £68,113. The London *Ironmonger* comments as follows on one item in the increase: "A few years ago a British manufacturer would have considered the possibility of sending twist drills to the United States as equivalent to sending coals to Newcastle, since the Americans invented the tool and have for years supplied it to our home market. During the present year, however, twist drills have figured as a small item in the Consular returns of exports from Sheffield to the United States. In the March quarter the item stood at £580, but last quarter it had increased to £699, and further increase is expected. Sheffield's cutlery exports to America last quarter showed an advance in value upon the corresponding period of last year of about £6,000."

Germany's production of pig iron for the first half of 1906 was 6,073,936 metric tons, as compared with 5,098,588 tons in the corresponding period of 1905. The 1906 product, accordinng to grades, was as follows: Foundry, 1,050,878 tons; Bessemer, 238,492 tons; basic, 3,910,349 tons; spiegeleisen, 454,407 tons; forge, 419,810 tons.

Pig Iron Production 12,602,901 Tons.

Unprecedented Record in the First Half of 1906.

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of pig iron in the United States in the first six months of 1906. The total was 12,602,901 gross tons, against 11,829,205 tons in the last half of 1905 and 11,163,175 tons in the first half of 1905. The total for the 12 months ending June 30, 1906, was 24,432,106 gross tons, exceeding by 1,439,726 tons the record made in the calendar year 1905. The following table gives the production by half-year periods, beginning with 1903:

	1903.	1904.	1905.	1906.
First half	9,707,367	8,173,438	11,163,175	12,602,901
Second half	8,301,885	8,323,595	11,829,205	.....
Totals	18,009,252	16,497,033	22,992,380	.....

The production in the first half of this year is remarkable for being greater than that of any whole year prior to 1899. The output by States was as follows:

Total Production of Pig Iron by States.

	Gross tons of 2,240 lbs. (Includes spiegeleisen and ferromanganese.)		
	First half of 1905.	Second half of 1905.	First half of 1906.
Massachusetts, Connecticut	7,636	8,351	10,218
New York	550,208	647,860	746,271
New Jersey	165,991	145,048	167,820
Pennsylvania	5,226,691	5,352,436	5,688,743
Maryland	156,334	175,762	194,907
Virginia	240,672	269,538	257,806
North Carolina, Georgia, Texas	25,752	12,947	46,865
Alabama	743,547	860,515	830,040
West Virginia	149,016	149,163	136,662
Kentucky	32,793	30,942	35,533
Tennessee	195,757	176,935	204,043
Ohio	2,181,058	2,405,052	2,675,812
Illinois	979,157	1,055,326	1,011,639
Michigan	147,953	140,751	190,899
Wisconsin, Minnesota	184,234	167,181	190,949
Missouri, Colorado, Oregon, Washington	176,376	231,398	214,694
Totals	11,163,175	11,829,205	12,602,901

The production of coke and anthracite pig iron by States was as follows:

Production of Coke and Anthracite Pig Iron.

	First half of 1905.	Second half of 1905.	First half of 1906.
New York	549,204	647,860	746,271
New Jersey	165,991	145,048	167,820
Pennsylvania	5,224,806	5,351,027	5,687,717
Maryland	156,108	175,762	193,498
Virginia, No. Carolina, Georgia, Texas	259,399	268,637	293,124
Alabama	729,845	848,669	819,390
West Virginia	149,016	149,163	136,662
Kentucky	32,793	30,588	34,580
Tennessee	195,180	175,037	203,509
Ohio	2,180,558	2,401,377	2,674,137
Illinois	979,157	1,055,326	1,011,639
Michigan, Wisconsin	182,415	149,642	190,900
Minnesota, Missouri, Colorado	188,191	248,653	235,932
Totals	10,992,663	11,646,789	12,395,179

The production of charcoal pig iron by States is shown in the following table:

Production of Charcoal Pig Iron.

	First half of 1905.	Second half of 1905.	First half of 1906.
Massachusetts, Connecticut, New York	8,640	8,351	10,218
Pennsylvania	1,885	1,409	1,026
Maryland, Virginia	1,125	946	2,727
Alabama	13,702	11,846	10,650
Georgia, Texas, Kentucky, Tennessee	6,703	15,154	*11,716
Ohio	500	3,675	1,675
Michigan	104,584	105,989	137,031
Wisconsin, Missouri, Oregon, Washington	33,373	35,046	32,679
Totals	170,512	182,416	207,722

* Includes 3,587 tons of mixed charcoal and coke iron in Georgia.

In the table below is shown the production of all kinds of pig iron in Pennsylvania and Ohio, by districts:

Production of Pig Iron in Pennsylvania and Ohio.

	Gross tons of 2,240 lbs. (Includes spiegeleisen and ferromanganese.)		
	First half of 1905.	Second half of 1905.	First half of 1906.
Pennsylvania:			
Lehigh Valley	316,721	309,579	333,179
Schuylkill Valley	290,266	263,428	352,599
Lower Susquehanna Valley	282,967	381,812	334,526
Juniata Valley	107,723	102,046	106,794
Allegheny County	2,716,668	2,694,222	2,856,327
Shenango Valley	882,834	906,182	1,026,306
Miscellaneous coke	627,627	693,758	677,986
Charcoal	1,885	1,409	1,026
Ohio:			
Mahoning Valley	855,336	869,591	949,222
Hocking Valley, Lake counties	558,092	742,355	744,139
Miscellaneous coke	594,140	603,898	774,734
Hanging Rock coke	172,990	185,533	206,042
Hanging Rock charcoal	500	3,675	1,675

The production of Bessemer and low phosphorus pig iron by States and by the various districts in Pennsylvania and Ohio is shown in the table below. The total for Pennsylvania was 3,220,655 tons and for Ohio 1,971,409 tons. The figures for the first half of 1906 include 114,447 tons of low phosphorus pig iron, against 109,270 tons in the last half of 1905:

Production of Bessemer and Low Phosphorus Pig Iron.

	First half of 1905.	Second half of 1905.	First half of 1906.
New York, New Jersey	239,525	297,412	376,271
Pennsylvania:			
Lehigh and Schuylkill valleys	55,535	55,817	67,122
Lower Susquehanna and Juniata valleys	218,057	300,570	267,184
Allegheny County	1,865,597	1,783,150	1,904,927
Shenango Valley	585,501	536,409	712,010
Miscellaneous coke	231,288	307,118	269,412
Maryland	156,108	175,762	193,498
West Virginia, Tennessee, Kentucky	153,857	161,843	141,741
Ohio:			
Mahoning Valley	593,859	619,157	754,662
Hocking Valley	.....	.....	.....
Lake counties	417,023	587,271	601,843
Hanging Rock bituminous	59,736	75,738	73,849
Miscellaneous bituminous	435,716	419,293	541,055
Illinois	796,763	859,517	817,182
Michigan, Wisconsin	36,629	55,044	61,310
Colorado	139,954	187,867	117,000
Totals	5,985,148	6,421,968	6,899,066

The production of basic pig iron in the first half of 1906 was 2,449,275 tons, against 2,138,587 tons in the last half of 1905 and 1,966,592 tons in the first half of 1905. Basic pig iron made with charcoal is not included. The production of basic iron by States is shown below:

Production of Basic Pig Iron, Not Including Charcoal Iron.

	First half of 1905.	Second half of 1905.	First half of 1906
New York, New Jersey	92,939	79,267	118,536
Pennsylvania:			
Allegheny County	753,449	784,460	845,780
Other counties	657,930	762,167	831,351
Virginia, Alabama	201,524	246,963	267,379
Ohio, Illinois, Missouri, Colorado	260,750	265,730	386,229
Totals	1,966,592	2,138,587	2,449,275

The production of spiegeleisen, ferromanganese, ferrophosphorus and ferrobessemer in the first half of 1906 was 160,833 tons, against 164,936 tons in the last half of 1905 and 129,040 tons in the first half of 1905. In addition to the above 3000 tons of Bessemer ferrosilicon were made in the first half of 1906.

The production of bituminous coal and coke pig iron in the first six months of 1906 amounted to 11,631,657 tons, as compared with 10,802,449 tons in the last half of 1905, an increase of 829,208 tons; anthracite and coke mixed, 754,743 tons, as compared with 829,396 tons in the last half of 1905; anthracite alone, 8,779 tons, as compared with 14,944 tons in the last half of 1905; charcoal, 204,135 tons, as compared with 182,416 tons in the last half of 1905, and charcoal and coke mixed, 3587 tons, as compared with no production with this fuel in the last half of 1905.

Germany's production of coal in the first half of 1906 was 67,257,295 metric tons, against 56,630,591 tons in the corresponding period of 1905. The production of coke for the half year was 9,778,480 tons, as compared with 6,554,776 tons in the first half of 1905.

THE IRON AGE

1855—1906.

New York, Thursday, August 9, 1906.

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The Steel Corporation's Dividend Action.

The declaration of a dividend on the common stock of the United States Steel Corporation is both effect and cause, viewed as a factor in the iron market. The generally admitted mistake of disbursing $48,000,000 as common-stock dividends in the formative and experimental period of the great consolidation makes more significant the action of last week, for the official, even though anonymous, expressions that have been printed from time to time have indicated that no haste would be made in resuming such payments. Thus the dividend, with the accompanying statement of earnings, becomes another of the accumulated proofs that the iron trade has had a marvelous half-year of profit—even beyond what has been appreciated. It is a proof that the Steel Corporation has of late been reaping a maximum of benefit from the seasoning of its organization and the perfection of its economies. These factors were absent in the first few years when the heads of the Corporation were finding their way, with some stumbling, where no road was blazed, and when the iron industry and all others were suffering from the sins of the captains of the security-making industry.

Scarcely less important than the record they emphasize is the influence the steel dividend and statement exert. Not only has this been apparent in the securities market, but the confidence of the Steel Corporation directors in the continuance of the present scale of operations in the iron trade has been contagious. The board represents so many important financial and railroad interests that its action will stimulate trade in numerous channels. The June flurry in the Southern pig-iron market and the earlier evidences of some yielding in bars have been forgotten in the growing momentum of summer buying, and the Steel Corporation evidently believes that the tide is to rise even higher.

A feature of the statement for the second quarter that calls for comment is the large amount set aside for additional property, construction and discharge of capital obligations. This was $13,000,000 as compared with $10,500,000 in the first quarter of the year. The total for the six months, $23,500,000, exclusive of the $5,000,000 taken from earnings for "special improvement and replacement funds," is almost as large as the amount appropriated for additions and new construction in all the year 1905, which was $26,300,000.

In the year 1904 no such appropriations were made. Naturally the policy is to make very liberal provisions for new property in times of good earnings to offset inability to do this in times of slackness.

Since the Corporation was formed the sums disbursed as dividends, including the dividends on preferred and common stock declared last week, have amounted to $209,275,989. This dividend total compares as follows with the total of appropriations from surplus for new property and capital expenditures, also with the amount remaining in surplus account.

Preferred dividends, 36¾ per cent	$155,926,082
Common dividends, 10½ per cent	53,349,907
Total dividends	$209,275,989
Appropriated from surplus for additional properties and construction and for contemplated appropriations ($58,827,364 to December 31, 1905, and $23,500,000 in first half of 1906)	82,327,364
Surplus June 30, 1906, after common dividend deduction	90,453,532

It would thus appear that about 55 per cent. of the amount considered applicable to dividends has been so disbursed and that 45 per cent. has been either carried to surplus or set aside for new property acquisitions. The appropriations for these additions, it is to be noted, are entirely apart from expenditures for maintenance and replacement. For ordinary maintenance and repairs the Corporation had spent to the close of 1905 no less than $85,207,759, and for extraordinary replacements a total of $42,464,584.

It would not be surprising if the requisitions of the operating men of the corporation have appeared enormous to members of the directorate little experienced in the steel industry. The prospectus of the banking house which promoted the formation of the Steel Corporation laid stress on the following statement:

> It is expected that by the consummation of the proposed arrangements the necessity of large deductions heretofore made on account of expenditures for improvements will be avoided, the amount of earnings applicable to dividends will be substantially increased, and greater stability of investment will be assured without necessarily increasing the prices of manufactured products.

Those who took the view that the big corporation would cure the expansion habit of the iron trade reckoned amiss. Probably the allusion of the prospectus was to duplication of plant by competitive building, like that of the threatened tube works of the Carnegie Company at Conneaut, Ohio. As a matter of fact, a tube plant of no less capacity than that proposed for Conneaut has been built at Lorain since the Corporation was formed and great extensions have been undertaken at McKeesport. So, even had there been no Steel Corporation, the Conneaut plant would not have been the serious menace it was painted. What has been substituted for competitive building and its accompanying disturbance of the trade is the orderly and systematic addition of new plant to meet, and even anticipate, the marvelously growing needs of the country. The Steel Corporation, with all its apparently lavish outlays for new construction, has not held the proportion of the country's output of iron and steel which it contributed in the first full calendar year of its existence. As indicated by the reports of the American Iron and Steel Association, the Corporation in 1905 produced 44.2 per cent. of the country's pig iron, as against 44.7 per cent. in 1902; 60.2 per cent. of the Bessemer and open-hearth steel ingots against 65.7 per cent.; 53.6 per cent. of the steel rails against 65.4 per cent.; and of all finished rolled products 47.3 per cent. against 50.8 per cent.

It is to be remembered in this connection that the Steel Corporation has been developing a foreign trade that is no longer insignificant. Its proportion of the domestic business has, therefore, declined somewhat more than the above percentages would show—a fact that makes the question of dividend declarations not the simple one that the size of the surplus might suggest. The iron trade of the United States may be alternately prince and pauper, in respect to profits, but it is always princely in the scale of its demands upon capital for expansion and rehabilitation.

The Question of Capitalization.

The developments of last week in regard to the United States Steel Corporation have revived discussion as to its overcapitalization. The statements of Senators Patterson and La Follette at Washington are quoted to the effect that those whose interests were acquired for the formation of the Steel Corporation received four for one, and the inquiry is raised as to what extent the new construction of the past five years and the acquisition of new raw material properties have reduced this inflation of values. So far as concerns most of the consolidations that went to make up the greater one, the basis of their taking over was well known—it was in most cases a fractional increase over a dollar for dollar exchange of capital stock. The Carnegie Steel Company transaction stood by itself and is the one that has been the basis for assertions like that quoted above, that the Steel Corporation stock represents several times the former legitimate capitalization of the included companies.

If overcapitalization means a capital issue representing at par more than the original cost of the plants, mineral properties, railroads, docks and vessels, there is no room for discussion. Nor is there any if the test be ability to pay interest on bonds and dividends on both kinds of stock in all kinds of times. On this last requirement there has already been default, and it would be folly to say that a suspension of dividends on the common stock will never occur again. What can be said is that the financial condition of the corporation and the earning capacity of its plants are vastly improved to-day over the conditions that existed five years ago, favorable as those were thought to be.

A comparison has been made in one of the late comments on the question of capitalization, between the cost of the new plant at Gary, Ind., and the entire capitalization of the consolidation. The *Evening Post* has put it in this way:

> This plant, according to official advices, will cost approximately $75,000,000. That is to say, a plant with a production of 1,750,000 tons of semi and finished steel a year is to cost $75,000,000, whereas properties with a capacity of say 8,000,000 tons were capitalized on a basis of nearly a billion and a half dollars. Based on the statement of Senator Patterson that the plants that are now the constituents of the Steel combine were taken over on a basis of four for one, the Indiana plant, had it existed at the time, would, theoretically speaking, have been taken over on a basis of $300,000,000, provided it had been possessed of adequate raw supplies.

That little qualification, "provided it had been possessed of adequate raw supplies," which is thrown in as though an afterthought, conceals the really preponderating asset. "Adequate raw supplies" bring such a property or collection of properties much nearer to a $300,000,000 capital basis than the writer appears willing to think. A blast furnace and steel plant from which 1,750,000 tons is to come in finished material in a year would require annually more than 4,000,000 tons of ore. A proper foundation in ore, say a 40 years' supply, such as the Steel Corporation and other large steel producers are assumed to have, would mean 160,000,000 tons. Based on the valuation well known to have been set in the Hill negotiations, we have the necessary ore about twice as valuable as the plant necessary to turn the ore into finished steel. Add to the ore properties coal lands containing 100,000,000 to 125,000,000 tons, chiefly of coking coal; and to this, coke ovens with an output of 2,000,000 tons a year; and to these a railroad from iron mines to upper lake docks, together with docks and a fleet of 20 modern vessels—and the total will probably exceed rather than fall under the $300,000,000 figure assumed to represent liberal watering of real values.

Much as has been said of the recent enhancement in the value of the high grade ore and fuel of which the Steel Corporation has so important a percentage, it is probable that there is still a very inadequate appreciation of the revolution that has taken place in this part of the iron industry and of its importance as a factor in present and future profits. Lake Superior ores are practically no longer a marketable commodity subject to the ups and downs of other years. They are simply so much raw material whose destination is fixed. They are to be worked up in certain groups of furnaces and steel plants. The business of such conversion is largely in the hands of corporations to whom millions of capital are as ten thousands were to those who carried on iron and steel manufacture in the haphazard way of 25 and 30 years ago. Not only in the United States but in all the important iron making countries of the world the industry is more and more falling within well defined lines. The chief requisites of those who would enter in are "adequate raw supplies" and practically unlimited capital. It is not a condition of monopoly, but one in which ignorance, incompetency and feebleness can have no place, as they had in the days when the doors to the iron trade swung open to every comer.

The Steel Corporation's founders may have capitalized the prosperity existing in 1901, as has often been said. They may also have capitalized exemption from overbuilding of plant and from reckless competition. They capitalized an organization probably not exceeded in managerial talent and in its mastery of economizing processes. Many other things which the consolidation régime brought to pass are represented in the capitalization. All these have been cumulatively operating in the past five years. But greater than all these things on which the prospectuses laid stress is the asset of mineral wealth. The common thinking which makes blast furnaces and steel works the chief representatives of values needs to be reversed. They are auxiliary and secondary—merely the instruments through which the ores are to assume marketable form.

A New Record in Iron and Steel Exports.

The fiscal year 1906, which ended June 30, was a record breaker in the value of iron and steel exports. The exports considered under this head include all kinds of partly manufactured iron and steel as well as highly finished products, such as builders' hardware, car wheels, cutlery, electrical machinery, cash registers, metal working machinery, laundry machinery, printing presses, pumping machinery, shoe machinery, locomotives, stationary engines, typewriters, woodworking machinery, stoves, &c. They do not include agricultural implements, however, in the construction of which a great deal of iron and steel enters, nor do they include iron ore. The figures for the fiscal year are $160,984,985, being far in excess of those of the previous fiscal year, which were $134,728,363.

Prior to 1905 high record was made in the fiscal year 1900, when the iron and steel exports totaled $121,913,548. For a long period up to the year 1900 our iron and steel exports showed a continuous increase from year to year, more than doubling in value that year over 1897, when the figures reached were $57,497,872. The fiscal year 1900 was one in which a great boom was experienced in the export trade, as we were then shipping iron and steel not only to Great Britain but also to other countries which had usually been in a position to supply their own requirements. A decline was experienced in the three following years, until in the fiscal year 1903 the exports had

fallen to $96,642,467. Since then the export trade has grown remarkably, the figures for the fiscal year 1906 showing nearly 75 per cent. increase on those of 1903.

Up to the early nineties our exports of iron and steel fell considerably below our imports. It was not until that time that the cost of production in this country declined to a point which permitted any considerable exportation of partly manufactured iron and steel. Our foreign trade in highly finished products had previously been increasing, due to the greater efficiency of our workmen and the widespread use of labor saving machinery. But when in the early nineties we added to the efficiency of our manufacturing methods the great advantages of much cheaper iron ore we were enabled so to reduce the cost of manufactured products that we made much greater inroads on foreign trade. This also had the effect of diminishing our purchases of foreign iron and steel. Our imports therefore fell off rapidly, until in the fiscal year 1899 we imported only to the value of $12,100,440. Imports then were a little larger for several years until in 1902-3, when for a few months quite a famine in iron and steel developed and we purchased so much abroad that the figures for the fiscal year 1903 ran up to $51,617,312. From that time the draft on foreign sources of supply diminished, until in the fiscal year 1905 we imported a total value of only $23,510,164. In the past fiscal year a slight increase was made in our imports, so that they showed a total value of $29,053,987. This, however, is less than one-fifth of the total value of our exports.

OBITUARY.

JOSHUA REGESTER, for many years engaged in bell casting and brass founding, making a great portion of the church bells now in use throughout the United States, died at Baltimore, Md., July 31, in his ninetieth year. He was born in Maryland in 1816, was brought up on a farm, and when 16 years of age he entered the employ of the Sharrer Brass Works, Baltimore. After learning every detail of the business, he organized in 1844 the brass founding firm of Clampett & Regester. The firm subsequently became Regester & Webb, then Joshua Regester, and next J. Regester & Sons. In 1884, when he retired from the firm, a corporation was organized named the J. Regester's Sons Company, which continues in business and is prominent in the manufacture of plumbers' supplies. He leaves a widow and four children.

DWIGHT SLATE, president and founder of the Dwight Slate Machine Company, Hartford, Conn., died July 31, aged 90 years. He was a native of Gill, Mass., and at 18 years of age entered the machine shop of Eli Horton, Stamford, Conn., where he displayed such unusual mechanical and inventive genius that he was made a partner before the close of his term of apprenticeship. While with the Pratt & Whitney Company, Hartford, he invented the lathe taper now in general use, the basic patent issued to him never being contested. He designed the sensitive drill and other tools now manufactured by the company which bears his name.

THOMAS F. MORRIN, president of the Morrin Climax Boiler Company of Brooklyn, died of apoplexy on July 31 at his home in Jersey City, aged 56 years. He had invented a number of improved appliances in machinery.

WILLIAM S. BOYD manager of the Scranton Supply & Machinery Company, Scranton, Pa., died suddenly on July 28, aged 45 years.

P. H. LAUFMAN, one of the first men in the country to successfully manufacture tin plate, died August 6 at his winter home, Southern Pines, S. C. Mr. Laufman went there last fall and when spring came he was unable to leave. He was 84 years old. Mr. Laufman's father was an iron maker in the Cumberland Valley. The son went to Pittsburgh in 1840 and soon afterward began the manufacture of hardware. Later he organized the firm of P. H. Laufman & Co., which in the late 80's started to manufacture tin plate in addition to steel specialties. His firm was absorbed by the United States Steel Corporation.

PERSONAL.

Howard A. Knauss, superintendent of the Northern Iron Company, Standish, N. Y., who recently resigned to take a similar position with the Empire Steel & Iron Company, Reading, Pa., was presented by the employees of the former company with a very fine mounted deer head as a mark of their esteem.

Frank Walker, heretofore connected with the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio, has been appointed superintendent of the converting department of the South Works of the Illinois Steel Company.

E. B. Tenny, formerly of Goshen, Va., has succeeded Howard A. Knauss as blast furnace superintendent of the Northern Iron Company at Standish, N. Y.

Mrs. Frances A. W. McIntosh, formerly advertising manager of the Standard Tool Company, Cleveland, O., and more recently connected with the advertising department of *Power*, New York, now has charge of the publicity department of the Norton Company, Worcester, Mass., the appointment taking effect August 1.

Charles Neumyer, lately with the Lackawanna Steel Company, at Buffalo, N. Y., has assumed the duties of superintendent of the open hearth steel plant of the Harrisburg Iron & Steel Company of Harrisburg, Pa.

Harry Brubaker, assistant superintendent of the Shelby, Ohio, plant of the Shelby Steel Tube Company, has been appointed superintendent of the plant of the Seamless Tube Company of America, Monessen, Pa.

A. A. Fowler, New York, partner in Rogers, Brown & Co., sailed for Europe last Saturday on a brief business trip.

The Production of Quicksilver in 1905.

WASHINGTON, D. C., August 7, 1906.—There was an important decline in the output of quicksilver during 1905, according to the annual report of the United States Geological Survey, compiled by F. W. Horton. The decrease in value was even greater, however, due to a marked decrease in demand, the average price for the year being $36.22 per flask, as compared with $43.50 in 1904. The production in the United States during the year 1905 amounted to 30,451 flasks (of 75 lb. net each), valued at $1,103,120, as compared with 34,570 flasks, valued at $1,503,795 in 1904, a decrease in quantity of 4119 flasks and in value of $400,675. This output was produced by four States as follows: California, 24,635 flasks; Texas, 4723 flasks; Utah, 1050 flasks; Oregon, 43 flasks. This falling off in production was due primarily to a lack of demand and a consequent decline in price and also to a depletion of the richer ore produced in some of the larger mines.

California Mines.

The amount of quicksilver produced in California during 1905—24,635 flasks, valued at $886,081, as compared with 29,217 flasks, valued at $1,270,200 in 1904—represents 81 per cent. of the total production of the country. The decrease of 4565 flasks in the quantity produced in this State during this year is due rather to a lessened production of all the mines than to any serious falling off in the output of any single one.

The decrease in the demand for quicksilver and the consequent decline in price were largely due to the modern practice of smelting silver and gold ores, when feasible, in place of subjecting them to amalgamation processes.

The import duty of 7 cents per pound on quicksilver is sufficient practically to prohibit importation. During the past five years the value of the product imported has ranged from $789 to $2166, quantities not being stated. The exports of quicksilver from the United States during 1905 were 1,009,444 lb., as compared with 1,611,635 lb. in 1904, a decrease of 602,191 lb., or 37.4 per cent.

W. L. C.

Progress in Nodulizing Fine Iron Ores.

A paper on "The Nodulizing and Desulphurization of Fine Ores" was presented by Albert Ladd Colby, New York, at the recent London meeting of the Iron and Steel Institute and the American Institute of Mining Engineers. It deals chiefly with the operations of the National Metallurgic Company, New York, in the nodulizing of fine ore at its plant on Newark Bay, New Jersey, as described and illustrated in *The Iron Age* of September 7, 1905, pages 589-592. Since that publication was made, however, the company has granted licenses for the use of its patent at other plants and has extended its own plant materially. The details of these enlarged operations are contained in Mr. Colby's paper, and are given below. The paper is accompanied by plan and photographic views of the Newark Bay plant, including a view of additions made for the leaching out of copper from copper pyrites cinder. Mr. Colby says that the National Metallurgic Company's process, employing a rotary kiln, has thus far successfully converted over 24,000 tons of fine ferruginous ores and by products into "nodules," which have been smelted in blast furnaces without the difficulties accompanying the use of large proportions of fine materials, and has economically reduced the sulphur present in objectionable quantities in the fine material. The Newark plant shipped 9477 gross tons up to May 1, 1906. Of the source of pyrite supply and of the operations at other plants the paper gives the following:

Pyrites from Newfoundland.

The Newfoundland Syndicate, of which the National Metallurgic Company is one of the constituent companies, owns immense pyrites and copper pyrites deposits in Newfoundland. The holdings include an area of about 125 sq. miles. Four large deposits are now being actively operated. The company is now delivering at the rate of about 70,000 tons of the pyrites and copper pyrites roasted in the United States per year, which in 1905 amounted to about 600,000 gross tons. It also controls for the next five years 80 per cent. of the cinder which will be made in the United States from the roasting of pyrites or copper bearing pyrites. During the development of the mines now in operation, as well as by the result of surveys of undeveloped properties, it became evident that the pyrites, as shipped, would contain copper in paying quantities. The addition to the Newark plant of a modernized Henderson copper leaching plant was therefore at once decided upon, and this is now in operation. There are now three kilns. No. 1, for nodulizing; No. 2, arranged by chimney and flue connections for either nodulizing or roasting with salt; and No. 3, intended entirely for the Henderson roasting. Since early in June, pending the completion of the leaching tanks, the smaller kiln, No. 1, and the standard kiln, No. 2, have together produced continuously some 250 gross tons of nodulized pyrites cinder per day of 24 hrs. By next autumn this plant will be further enlarged by the addition of two more nodulizing kilns, which are now ready for delivery.

Pennsylvania Nodulizing Plants.

A plant at Aspinwall, near Pittsburgh, Pa., will be in operation in August. It contains two large nodulizing kilns with an estimated output of 250 tons of nodulized material in 24 hrs. The kilns will be fired with natural gas. The plant has been located with regard to the nodulizing of the large quantities of flue dust necessarily made by the many blast furnaces of the Pittsburgh district, all of which use a large proportion of Mesaba and other fine Lake Superior hematites in their ore mixture, and also with regard to the convenient delivery of pyrites cinder from sulphuric acid works at Beaver Falls, Titusville, Cleveland and other interior points.

A plant with one kiln was built and put in operation in June, 1905, by the Pennsylvania Steel Company at its works at Steelton, Pa., operating under a license from the National Metallurgic Company. This plant has successfully nodulized magnetic concentrates, fine ores from Mesaba District and the Lake Superior region, and flue dust from its blast furnaces mixed with the two former materials. It is about to build, under its license, another plant of three nodulizing kilns for the treatment of fine ores. The nodulizing product, estimated at 450 tons per day of 24 hrs., will be consumed in its own blast furnaces. The following analyses are representative of current practice in nodulizing fine magnetites at Steelton:

	Magnetic concentrates. Per cent.	Nodules from magnetic concentrates. Per cent.
Iron	59.64	61.25
Sulphur	1.15	0.13
Phosphorus	0.01	0.01
Silica	8.50	8.61

The New Jersey Zinc Company is the owner of the celebrated mine of franklinite at Franklin, New Jersey. At two of its plants, situated at South Bethlehem and at Hazard, Pa., the company crushes this ore and roasts it on open grates with fine coal, catching the zinc oxide in flues, and smelting the cinder left on the Wetherill grates in a small blast furnace with other ores for the manufacture of spiegeleisen. The fine franklinite produced in the crushing prior to roasting as it passed through an 80-mesh sieve fell through the grates. It was therefore determined to try nodulizing this fine material into uniformly sized lumps. A trial lot of some 300 tons was very successfully nodulized at the Newark plant, with but little or no loss of zinc. The fine franklinite possessed the following chemical composition:

	Per cent.
Zinc	17.40
Manganese	8.50
Iron	15.76
Silica	11.37
Lime	16.14
Magnesia	1.44
Loss on ignition	11.18

The nodules of the desired size contained 20.4 per cent. of zinc. As the result of this experiment a nodulizing plant has been erected at Hazard, and it will be in operation very shortly. This experiment shows that the kiln temperatures can be readily controlled, and that material containing volatile metals can be nodulized practically without any loss of the valuable volatile constituents.

The Empire Steel & Iron Company, Catasauqua, Pa., owns and operates a large mine of magnetite, located at Oxford, N. J. The Oxford property covers about 2500 acres of iron ore lands, and the company controls the mineral rights for several thousand additional acres. The vein is very well and sharply defined, and extends for at least 2 miles at widths varying from 20 to 40 ft. The company is thus fortunate in owning what is probably the largest magnetite ore body in New Jersey. The shipments from one shaft now amount to 8000 tons per month. A representative analysis of the run of the mine is as follows:

	Per cent.
Iron	60.00
Sulphur	3.00
Phosphorus	0.48
Silica	6.00

There is a considerable quantity of ore somewhat lower in iron than the above, which is also very high in sulphur, as shown by the following analysis of crushed ore.

	Crushed raw ore. Per cent.
Iron	57.95
Sulphur	3.58
Phosphorus	0.597
Silica	8.72

With a view to ascertaining the best mode of dealing with the latter ore, the company obtained a trial run at the Newark plant of the National Metallurgic Company of some 50 tons of crushed ore. The results of this trial were perfectly satisfactory as far as the nodulizing was concerned, but tests taken every hour during the 10-hour run, while showing low sulphur in some samples, did not show a uniform reduction of sulphur. This was due to the treatment of an insufficient quantity of ore to permit a proper regulation of feed, and consequently the

exposure for too short a period of the mixture of ore and tar in the upper portion of the kiln where the roasting takes place. The Empire Steel & Iron Company proposes to sink another shaft, so as to increase its monthly output to 16,000 tons and to concentrate all the ore mined. It will nodulize a fine ore, carrying about 65 per cent. in iron. The concentration will incidently reduce the phosphorus, as it occurs as apatite, and probably reduce the sulphur from 3.00 to 1.00 per cent., and thus insure a nodulized magnetite uniformly well below 0.10 per cent. in sulphur.

The Modified Henderson Process.

The National Metallurgic Company made a radical departure by adopting the rotary kiln at the Newark plant for the roasting of the ground mixture of copper pyrites cinder and salt. This will prove a great economy over the styles of furnaces formerly used, for the kiln and its accessories are automatic in their operation, and the labor, especially in handling and rabbling the mixture, is greatly reduced. The mixture will be handled by a belt conveyor from the grinding mills to the storage tank, from which, by a bucket elevator, it is fed automatically through a screw feed into the kiln. Eventually the moist ore, free from copper, will be transferred by overhead bucket crane to small tipping wagons that will be emptied into the storage tank, from which it will be delivered to the nodulizing kiln by an automatic plunger feed device, receiving its proper proportion of tar as it enters the kiln. Copper pyrites cinder containing as low as 1.50 per cent. of copper can be handled with a profit in this nodulizing Henderson plant.

Nodules made from pyrites cinder, concentrated magnetite and flue dust have been used so far at six different blast furnace plants, up to, in some cases, over one-half of the ore mixture, and in all cases with such satisfactory results that the demand far exceeds the present sources of supply. The National Metallurgic Company is about to erect its third plant, probably of four kilns, and is in active negotiation for putting up plants to convert fine sulphurous iron ores into marketable shape.

Canadian Pig Iron Production for Six Months.

The American Iron and Steel Association's statistics of the production of pig iron in Canada in the first six months of 1906 show a large increase as compared with either of the two halves of 1905. The production in the first half of 1906 amounted to 282,010 tons, against 257,797 tons in the last half of 1905 and 210,206 tons in the first half of that year. The production in the first six months of 1906 was the greatest in any half year in the history of the Dominion, exceeding by 24,213 tons that of the last half of 1905, the next highest half year. It was also greater than the production of any whole year prior to 1902.

The production of Bessemer pig iron in the first half of 1906 amounted to 79,051 tons, against 85,418 tons in the last half of 1905, a decrease of 6367 tons. In the first half of 1905 the production was 63,785 tons. The production of basic pig iron in the first half of 1906 amounted to 135,298 tons, against 103,724 tons in the last half of 1905, an increase of 31,574 tons. In the first half of 1905 the production was 68,378 tons.

On June 30, 1906, Canada had 15 completed blast furnaces, of which 12 were in blast and 3 were idle. Of this total 11 were equipped to use coke and 4 to use charcoal. In addition 1 coke furnace was being built on June 30. On 3 coke furnaces partly erected on the same date work had been suspended for some time. One coke furnace was also projected at the close of June. The total number of furnaces in Canada in blast for all or a part of the six months was 13, of which 10 used coke and 3 used charcoal. One coke furnace and one charcoal furnace were idle throughout the six months.

The Lewis and Clark Centennial Exposition, Portland, Ore., on August 2, declared a dividend of 23½ per cent. on the par value of the stock. It also declared itself dissolved.

Pennsylvania Mine Inspection.

HARRISBURG, PA., August 7, 1906.—Important recommendations concerning coal mining and the State control of quarrying in Pennsylvania are contained in the report of James E. Roderick, Chief of the Department of Mines. Reviewing the coal mining operations in the anthracite and bituminous fields for the calendar year 1905 he urges that the State Legislature which will meet next January pass laws which will bring under State supervision the extensive slate, cement, ore, graphite, fire clay and limestone quarrying operations of the State, which, as he says, although employing thousands of men, are wholly without State supervision. This is the first time that such a recommendation has been made by a Pennsylvania official, and if a law is enacted it will give the department the widest supervision of any similar department in any State government in the United States.

The report calls for a law which will make an age limit at which youths may enter mine employ uniform in both anthracite and bituminous fields, there being two laws with different limits now; for 14 years outside and 16 years inside in all mines, 21 being set as a limit at which they can become miners, and for no distinction between hard and soft coal mines. There is a demand for wider boundary pillars in mines, better timbering and more care for life. In the latter connection he says the law must reach both operators and miners, and suggests a commission of experts to draft a new law. The report notes an increase of electricity in mine machinery, but cautions using it in gaseous mines. Calling attention to the accidents, Chief Roderick blames foreign laborers for many of them, saying: "It would be a most humane act if foreigners could be prevented from working in the mines until they have acquired at least the rudiments of the English language, unless they can be put to work with competent men of their own nationality."

The statistical part of the report shows that Pennsylvania produced practically all of the anthracite and 30 per cent. of the bituminous coal of the United States, its mines turning out 49 per cent. of the nation's coal. The bituminous output was 119,361,514 net tons, and anthracite 78,647,020 tons, the value being about $350,000,000 at mines, and almost twice as much at distributing points. The loss of life was 644 in hard coal mines and 479 in bituminous mines.

Former United States Senator James Smith, Jr., receiver for the United States Shipbuilding Company, has filed his final report with the Clerk of the Chancery Court at Trenton. He states that after paying all indebtedness he has on hand $16,941, which he asks to be distributed. The receiver states that when he was appointed the company was hopelessly insolvent, as were some of its constituent companies, and some of its creditors despaired of receiving more than 5 per cent. on their claims. But by good management the assets were made to pay more than was possible at first. Hence all claims were settled and the bondholders were permitted to participate in a reorganization of the company upon terms more profitable to them by many millions of dollars than at one time seemed possible.

One of the largest single shipments recently made from the works of the Westinghouse Electric & Mfg. Company at East Pittsburgh, Pa., is strikingly shown in a photograph of a train taken just as it was pulling out of the East Pittsburgh yards, the destination of the entire train being the Hauser Lake power plant of the Helena Power Transmission Company at Iron Siding, Mon. The train was composed of 19 cars, and the shipment consisted, among other apparatus, of the following: Four 2800-kw. Westinghouse revolving field generators, intended for direct connection to water wheels; two 200-kw. direct connected exciters, also intended for direct connection to water wheels; nine 2000-kw. water cooled transformers.

Pig Iron Production Decreasing.

The output of the coke and anthracite blast furnaces of the country was 2,013,402 gross tons in July, as compared with 1,976,733 tons in June, or at a daily rate of 64,948 tons, against 65,891 tons in June. The changes in the active list in July, which were numerous, have resulted in a further decrease in the total capacity at work, this being at the rate of 451,908 tons a week on August 1, against 460,570 tons on July 1. The number of furnaces in blast on August 1 was 294, as against 293 on July 1.

The following table gives the production of the coke and anthracite furnaces in July, as compared with the records for the preceding four months:

Monthly Pig Iron Production.—Gross Tons.

	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)
New York....	135,713	127,674	134,048	129,834	141,885
New Jersey...	28,840	33,742	35,973	32,858	34,814
Lehigh Valley.	62,724	56,718	53,613	49,704	51,761
Schuylkill Val.	54,826	52,492	48,760	56,921	52,751
Lower Susquehanna and Lebanon Val.	69,225	61,831	57,951	60,219	61,132
Pittsburgh dis.	533,100	498,874	509,777	487,900	505,570
Shenango Val.	178,378	172,342	176,913	157,313	150,116
West. Penn..	106,338	105,190	112,985	100,505	103,733
Md., Va. and Kentucky....	83,031	75,030	77,069	75,016	73,888
Wheeling dis..	126,343	113,188	104,109	93,618	101,573
Mahoning Val..	169,468	163,019	147,433	149,943	161,073
Central and North. Ohio.	173,494	163,152	168,672	149,944	147,162
Hocking Valley and Hanging Rock	36,675	33,940	36,103	33,559	31,643
Ill.,Mich.,Minn., Wis., Mo. and Colo.....	231,815	240,043	255,256	236,528	232,954
Alabama.....	135,739	137,049	137,790	124,606	127,165
Tennessee, No. Caro., Texas and Georgia.	39,923	38,938	42,294	38,265	36,182
Totals....	2,165,632	2,073,222	2,098,746	1,976,733	2,013,402

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawana, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of products month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1904.	1905.	1906.	1905.	1906.
January	502,994	1,129,042	1,358,015	21,002	26,305
February	756,260	1,027,937	1,226,760	22,431	26,988
March	913,412	1,232,255	1,400,395	21,280	23,595
April	974,006	1,222,710	1,333,591	20,038	28,054
May	927,534	1,287,438	1,372,423	24,732	29,447
June	788,882	1,149,404	1,293,437	21,761	22,737
July	694,892	1,114,409	1,323,391	31,220	20,153
August	747,570	1,186,050	...	27,461	...
September ...	936,494	1,262,033	...	21,645	...
October	971,447	1,370,960	...	26,799	...
November	962,384	1,334,644	...	23,776	...
December 1,019,841		1,356,962	...	29,481	...

Among furnaces blown in in July were Macungie and one Crane in the Lehigh Valley, Marshall in western Pennsylvania, Norton in Kentucky, Riverside at Wheeling; one Columbus Iron & Steel Company and Toledo in Ohio; Star in the Hanging Rock region; one North Works of the Illinois Steel Company at Chicago; Thomas at Milwaukee; Cherry Valley in the Mahoning Valley; one Clifton, one Sloss and Lady Ensley in Alabama, and Citico in Tennessee.

Among furnaces blown out in July were one Shoenberger, one Donora and one Edgar Thomson in the Pittsburgh District; Adrian and one Cambria in western Pennsylvania; Alleghany in Virginia; one Maryland Steel Company at Sparrows Point; one South Chicago and one Union of the Illinois Steel Company; Mattie in the Mahoning Valley; Fannie, one Shenango and one South Sharon in the Shenango Valley. Two additional Mahoning Valley furnaces are now out for relining.

The table below gives the active capacity per week of furnaces producing coke and anthracite iron on August 1 and the corresponding figures for July 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces	Total number of stacks.	August 1.— Number in blast.	August 1.— Capacity per week.	July 1.— Number in blast.	July 1.— Capacity per week.
New York:					
Buffalo 13	13	13	27,349	13	26,290
Other New York...10	5	5	4,816	5	4,084
New Jersey..... 8	7	7	7,702	7	7,514
Spiegel 2	1	1	161	2	161
Pennsylvania:					
Lehigh Valley.....27	18	18	11,533	16	11,370
Spiegel 2	2	2	154	2	227
Schuylkill Valley...13	11	11	11,914	12	13,282
Low. Susquehanna.. 8	4	4	5,850	4	6,863
Spiegel 2	2	2	680	1	365
Lebanon Valley....11	10	10	7,315	10	7,523
Pittsburgh dist....41	38	38	107,858	41	112,845
Spiegel 3	3	3	2,712	3	2,639
Shenango Valley...20	16	16	31,248	19	36,546
West. Penn.....24	17	17	22,183	18	24,149
Maryland 5	3	3	6,244	4	7,471
Wheeling dist.....14	13	13	25,002	12	22,708
Ohio:					
Mahoning Valley...16	14	14	36,372	15	34,216
Cent. and Northern and Michigan....19	18	18	34,850	16	34,566
Hocking Valley and Hanging Rock...12	11	11	7,458	10	7,939
Illinois 19	18	18	38,527	18	38,483
Spiegel 3	1	1	842	2	1,201
Minnesota 1	1	1	1,146	1	1,243
Wisconsin 5	5	5	5,082	4	4,366
Missouri 1	1	1	775	1	770
Colorado 4	4	4	5,649	3	6,075
Spiegel 1	0	0	0	1	720
The South:					
Virginia 23	12	12	8,647	13	9,033
Kentucky 7	3	3	2,145	2	1,140
Alabama 46	26	26	28,714	23	28,072
Tennessee 16	15	15	7,704	14	7,764
Georgia and Texas. 2	2	2	1,276	1	945
North Carolina.... 1	0	0	0	0	0
Totals.....379	294	294	451,908	293	460,570

For a series of months the active coke and anthracite capacity fluctuated as follows, in gross tons:

	Capacity per week.		Capacity per week.
August 1.....	451,908	April 1.....	337,257
July 1.....	460,570	March 1.....	308,751
June 1.....	472,622	February 1.....	273,692
May 1.....	484,031	January 1, 1904....	185,636
April 1.....	484,240	December 1, 1903...	244,156
March 1.....	479,737	November 1.....	273,715
February 1.....	482,156	October 1.....	353,142
January 1, 1906.....	463,673	September 1.....	360,197
December 1, 1905...	475,814	August 1.....	353,681
November 1.....	460,449	July 1.....	384,825
October 1.....	445,468	June 1.....	388,178
September 1.....	412,563	May 1.....	373,496
August 1.....	410,088	April 1.....	386,215
July 1.....	408,617	March 1.....	347,424
June 1.....	443,092	February 1.....	335,339
May 1.....	452,031	January 1, 1903....	346,073
April 1.....	439,564	December 1, 1902...	336,617
March 1.....	403,157	November 1.....	330,110
February 1.....	405,792	October 1.....	337,837
January 1, 1905....	377,879	September 1.....	328,243
December 1, 1904...	357,846	August 1.....	328,745
November 1.....	334,249	July 1.....	303,793
October 1.....	319,249	June 1.....	337,492
September 1.....	291,573	May 1.....	337,627
August 1.....	246,092	April 1.....	331,140
July 1.....	272,301	March 1.....	316,039
June 1.....	336,107	February 1.....	325,440
May 1.....	368,244	January 1, 1902.....	291,992

The Lunkenheimer Company's annual picnic was given this year on July 28. This picnic was tendered to all of the employees of the company, including their families, and was held at Woodsdale Island, a pleasure resort about 30 miles from Cincinnati. The company furnished all the amusements, refreshments and transportation. Two bands of music were in attendance, together with a troupe of professional entertainers. There were 2500 people in attendance.

At Milan, Italy, the International Exposition was extensively damaged by fire on August 3. The sections devoted to the decorative arts of Italy and Hungary were totally destroyed. The fire is attributed to an electric short circuit, the authorities rejecting the theory of incendiarism.

NEWS OF THE WORKS.

Iron and Steel.

The Leesport Furnace, at Leesport, Pa., which has been idle for some weeks for repairs, is expected to blow in in August.

The new furnace which the New Jersey Zinc Company is building at Palmerton, Pa., will be ready for blast in October.

The Alabama Consolidated Coal & Iron Company's three furnaces are now all active, one that had been idle for repairs having resumed in July. The company expects to have its new furnace at Gadsden, Ala., in blast in November.

Ella Furnace of the Lacey-Buck Iron Company, Trussville, Ala., which has been out of blast since June 16, is expected to blow in about September 1.

The Birmingham Iron Company, successor to the Tutwiler Coal, Coke & Iron Company, expects to break ground soon for its new furnace at Boyles, Ala., which will be 18 x 80 ft.

The furnace of the Chattanooga Iron & Coal Company, at Chattanooga, Tenn., was banked from June 9 to July 5.

The furnace of the Embree Iron Company, Embreeville, Tenn., which blew out on May 15 for repairs and relining, will probably blow in about August 15.

Sam Lanham Furnace, at Rusk, Texas, was operated on coke instead of charcoal in the first half of 1906. It was the only furnace in Texas which was in blast in the first half of the year.

Thomas Furnace, Milwaukee, Wis., which went out of blast on June 30, resumed on July 23.

One Donora furnace of the Carnegie Steel Company, at Donora, Pa., was blown out for relining on July 31.

One Edgar Thomson furnace of the Carnegie Steel Company was blown out in July for repairs.

One Crane furnace of the Empire Steel & Iron Company, Catasauqua, Pa., which has been out for repairs, was blown in on July 11. Macungie Furnace of the same company, at Macungie, Pa., was blown in on July 10.

The Southern Steel Company's furnace at Gadsden, Ala., is expected to resume operations early in August.

Mattie Furnace, at Girard, Ohio, was blown out on August 1. It will resume about October 15.

The furnace of the Cherry Valley Iron Company, at Leetonia, Ohio, which had been out for repairs, blew in on July 19.

No. 2 Furnace at the North Works of the Illinois Steel Company, Chicago, blew in on July 18. No. 8 Furnace at the South Works of this company blew out on July 11. One furnace at the Union plant blew out on July 28.

One furnace of the Wellston Iron & Steel Company, Wellston, Ohio, which was blown out in the first week in June, will resume about August 15.

One Watts furnace of the Virginia Iron, Coal & Coke Company, Middlesboro, Ky., which blew out in July, will be idle for an indefinite period.

Adrian Furnace, at Du Bois, Pa., blew out on July 23 for relining.

One furnace of the Cambria Steel Company, Johnstown, Pa., blew out on July 23 for repairs.

Nittany Furnace of the Nittany Iron Company, Bellefonte, Pa., was banked from July 15 to July 31 for repairs.

Fannie Furnace of the Cherry Valley Iron Company at West Middlesex, Pa., blew out on July 20 for repairs.

One furnace of the Carnegie Steel Company, at South Sharon, Pa., blew out on July 20.

No. 4 Furnace of the Shenango Furnace Company, Sharpsville, Pa., was blown out on July 20 for repairs.

The Atikokan Iron Company, Limited, Port Arthur, Ont., expects to have its new coke furnace ready for operation by October 1.

The Dominion Iron & Steel Company, Limited, Sydney, Nova Scotia, is relining one of its four blast furnaces.

The Algoma Steel Company, Limited, Sault Ste. Marie, Ont., has discontinued the manufacture of charcoal pig iron and its two furnaces are now using coke alone.

The new furnace of the Burden Iron Company, Troy, N. Y., has a capacity of 90,000 tons a year and will produce forge iron for the connected rolling mills. The furnace was blown in on May 27.

H. H. Hossman and John F. Morgan of Portsmouth, Ohio, and Moses Morgan, John Thomas and D. Davis of Jackson, Ohio, have incorporated a company to build and operate a blast furnace in Jackson County, Ohio. H. H. Hossman is engineer.

The Andrews Steel Company, Newport, Ky., which, as was recently stated in these columns, is to erect a 24-in. bar mill, is not connected with the Licking Rolling Mill Company.

Allegheny Furnace of the Allegheny Ore & Iron Company, Iron Gate, Va., was in blast only five days in the month of July.

General Machinery.

The Fulton Foundry & Machine Company, Atlanta, Ga., has announced the opening of its new shops at Kirkwood, on the line of the Central of Georgia Railroad.

The Woburn Gear Works, 36 Nashua street, Woburn, Mass., is a new firm composed of H. A. Warren, E. H. Warren and E. C. Warren, the two latter having had years of experience in gear cutting. At present the company is prepared to do small and medium work, but later expects to add larger sizes. A circular just issued illustrates work in pinion wire, racks, small gears and pinions, medium size gears, worms and worm gears. A specialty of 2 to 1 gears for gasoline engines is made.

The Tifton Foundry & Machine Company, Tifton, Ga., was organized July 16 under the State laws of Georgia, succeeding to the business commenced some time before by Carson & Fulwood. The company does general machine and foundry repairs, especially in engines, both locomotive and stationary, and is open to estimate on the manufacture of new work.

The Quaker City Iron Works, Philadelphia, has been chartered with a capital of $10,000. The incorporators are A. Letchworth, 222 Winona avenue, Germantown, Pa., and H. M. League and Robert Mair, Philadelphia.

The Tomlin-Harris Machine Company, Cordele, Ga., has about completed an addition to its plant which will double the previous floor space. It has installed a traveling crane and will pipe compressed air throughout the whole works. An excellent demand is reported for hydraulic wheel presses, the manufacture of which the company makes a specialty.

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has arranged to take over the plant and business of the Waterbury Machine Company in accordance with plans made last month, when the capital of the Waterbury Farrel Foundry & Machine Company was increased from $400,000 to $440,000. With the $40,000 increase the company has taken over all of the Waterbury Machine Company's stock, which had not been previously bought by an exchange of shares. No change will be made in the management of either of the plants and the merger is principally a strengthening of an alliance that has existed for some time. The machine company manufactures presses, dies, patent wire drawing machinery, lathes, tumbling barrels, hook and eye and safety pin machinery and the like.

The Spalding-May Foundry & Machine Company, Atlanta, Ga., successor to the Stevens Machine Company, has erected new works on the Southern Railroad Belt Line, just outside the city limits. The machine shop and foundry are of same dimensions, 60 x 80 ft., and there is an intermediate building, 40 x 60 ft., for the cleaning of castings. The equipment of the old machine shop and foundry has been installed, with the addition of a new cupola and a 60-in. boring mill. General machinery and foundry work is done, a specialty being made of the manufacture of fertilizing machinery.

The Bath Grinder Company, manufacturer of universal surface and plane grinders, Fitchburg, Mass., has found it necessary to secure larger quarters to take care of its increased business, and is now located in the Putnam shop, which formerly was the tool shop of the Putnam Machine Company. The company occupies the entire first floor, which is being equipped with machinery as fast as possible. The company has just incorporated its business with a capital stock of $40,000, and Robert D. Gould of the Fitchburg Hardware Company has become associated with the former owners. John Bath is president; Arthur N. Goodnow, vice-president, and Robert D. Gould, treasurer.

In order to simplify and expedite the conduct of their business, the Traylor Engineering Company and the Traylor Mfg. & Construction Company have been consolidated under the name of the Traylor Engineering Company, with a capital stock of $600,000, of which $500,000 is issued to pay for the properties taken over, the balance remaining in the treasury for future needs. In taking over these two companies the new company secures a new and well equipped plant at Allentown, Pa., as well as the large business of the Traylor Engineering Company, whose offices will be continued at 118 Liberty street, New York. Samuel W. Traylor is president and treasurer; Bruce W. Traylor, vice-president; Joseph S. Buhler, secretary, and Frank W. Hopkins, assistant treasurer. The company recently secured an order from the Gold Cañon Mining Company, Gold Cañon, Nev., for a complete air compressor and drilling plant, and one from the Cocomongo Gold Mining Company of the same place for a similar outfit.

The plant of the Pittsburgh Steel Construction Company at Economy, Pa., is to be doubled in capacity. The new machinery, including two 30-ton electric cranes, has been ordered and will be installed as soon as received.

The Teetzel Well Works has been incorporated at South Bend, Ind., to manufacture well and other machinery, with $10,000 capital stock. The directors are John W. Teetzel, Fred W. Hoffman and Jacob J. Hoffman.

The F. S. & G. L. Brown Machine Company, Baltimore, Md., has been organized to continue the business established by F. S. and G. L. Brown in 1879, for the manufacture of presses, dies and special machinery. The new company was organized to take care of the increasing business of the old corporation and will occupy the old company's present plant. It is stated that no additions will be made to the plant at present, but the

company hopes to eventually add the adjoining plot of ground to its plant, with additional buildings. The officers of the new corporation are: Frank S. Brown, president; Fred. R. Brown, vice-president, and George L. Brown, secretary and treasurer.

Power Plant Equipment.

A slight error was made in an item printed recently regarding the power plant being installed by the Oliver Iron & Steel Company, Pittsburgh. The company is installing two 1000-kw. turbo generators, provision being made for additions, and which are equipped with condensers. The power to be generated from this plant is to be used in the Oliver Company's mills on the South Side, Pittsburgh.

The De La Vergne Machine Company, New York, reports the following recent orders for Hornsby-Akroyd oil engines: Wheaton Seminary, Norton, Mass., 13 hp.; P. R. Mfg. Company, Detroit, Mich., 50 hp.; Rahr Brewing Company, Oshkosh, Wis., 32 hp.; Vitagraph Company, Brooklyn, N. Y., 25 hp.; Regal Oil & Gas Company, Chicago, 65 hp.; L. R. Wright, Pecos, Texas, 13 hp.; Jas. H. Holden, Fall River, Mass., 75 hp.; Borough of Souderton, Souderton, Pa., 50 hp.; James L. Breeze, Southampton, L. I., 35 hp., direct connected to 25-kw. generator.

The following sales of horizontal center crank automatic engines, completely inclosed, with forced lubrication under 15 lb. pressure, have been made by B. F. Sturtevant Company, Boston, Mass.: High Rock Knitting Company, Philmont, N. Y.; Wrentham Hat Company, Wrentham, Mass.; City & Suburban Home Company, New York City; Missoula Light & Water Company, Missoula, Mont.

Two standard economizers are being installed by the B. F. Sturtevant Company, Boston, Mass., for the American Steel & Wire Company, Worcester, Mass. They will serve 3000 boiler horse-power.

The Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company, East Pittsburgh, Pa., are constructing the machinery for what will be the largest power transmission plant in South America. It is to be located a short distance from Rio Janeiro, will be known as the Brazilian Niagara, and will have a capacity of 40,000 hp.

The Board of the Southern Hospital for the Insane, room 81, State House, Indianapolis, Ind., will receive bids August 21 for constructing the various new buildings, pipe tunnels, heating and power equipment, &c. Foltz & Parker, Indianapolis, are the architects.

Foundries.

Some extensive improvements are being made by the National Radiator Company, Johnstown, Pa., to take care of the company's increased business. A storage shed, 85 x 160 ft., has been erected, with railroad tracks running along its entire length. Foundations are laid for a core and cleaning room, and a large addition to the foundry is also under way, which will add 60 x 160 ft. of floor space, making the foundry end of the plant cover 25,800 sq. ft. With these additions the capacity of the works will be increased about 40 per cent.

The Birmingham Engineering & Construction Company, Birmingham, Ala., formerly the Means & Fulton Iron Works, which was recently purchased at receiver's sale by W. P. G. Harding, has been reorganized as the McClune Iron Company with a capital stock of $25,000. The officers and directors are: J. H. McClune, president and manager; C. Exurer, vice-president; Charles Glidden, secretary and treasurer; Walker Percy, L. Hoover and W. P. G. Harding.

The Challingsworth Foundry & Machine Company, Mt. Vernon, Ohio, has placed contract with the Mt. Vernon Bridge Works for an extension of upwards of 12,000 sq. ft. to its foundry, and has lately installed another 30-ton Case traveling crane. The company is about to install air compressors and other equipment. This addition will make the foundry one of the largest and best equipped job foundries in the State.

The Spring Drill Company, Peru, Ind., will build and equip a new foundry.

The Terre Haute Malleable & Mfg. Company has been incorporated at Terre Haute, Ind., with $55,000 capital stock. The directors are A. W. Wagner, Henry J. Wagner and E. A. Biggs.

Hardware.

Wilcox, Crittenden & Co., Middletown, Conn., manufacturers of marine hardware, have awarded a contract to the H. Wales Lines Company, Meriden, Conn., for the construction of a four-story brick and stone building, 60 x 100 ft. in size, of heavy mill construction. The new structure will be used for a machine shop, grinding department, shipping room and for storage purposes, and it is expected that it will be completed by November 1.

An addition is being made to the plant of the L. S. Starrett Company, Athol, Mass., maker of fine mechanical tools, which is to be 35 x 288 ft. in size and four stories in hight. The building will be of brick and concrete up to the first story and the second floor will be of steel and concrete, while the two upper floors are to be of heavy North Carolina pine. The structure will be fitted with automatic sprinklers, fireproof doors and other up to date improvements.

The Bostrom-Brady Mfg. Company, Atlanta, Ga., manufacturer of Bostrom's improved farm and builders' levels, is removing its plant to the building on the corner of Madison avenue and Garnett street, where the company will have enlarged and improved facilities for manufacturing. An increased demand for the levels is reported from all parts of the United States and also from abroad.

The Indiana Mfg. Company, Peru, Ind., has sold to the Government for shipment to Panama 50 refrigerators. The plant is turning out 70 refrigerators daily and is planning to increase its capacity largely.

The G. White Axe Company, Honesdale, Pa., has been formed. Charles Genung, Honesdale, Pa., is the treasurer.

The Atlanta Wood & Iron Novelty Works has been established at 389 Marietta street, Atlanta, Ga., for the manufacture of a patented portable dental chair. Other iron and wooden novelties will also be manufactured.

Miscellaneous.

J. P. McCune, superintendent of the Alabama Great Southern Railroad, has been in Gadsden, Ala., the last few days completing the final arrangements for constructing the big car works.

The Neches Iron Works, Beaumont, Texas, has filed an amendment to its charter increasing the capital stock from $50,000 to $100,000.

The Undercurrent Traction Company has been incorporated at Lockport, N. Y., with a capital of $100,000 and will locate its factory and offices in that city. The company will manufacture a patented device for the operation of electric cars, the current being received underneath the car. It is stated that the new company is controlled by the Niagara, Lockport & Ontario Power Company.

The Atlas Car & Mfg. Company, Cleveland, Ohio, has recently added considerable new machinery, including bending rolls, punches, large lathes and other machinery, for the production of mine and ore cars and industrial equipments. It has more business in these lines than ever before and its shop is running double turn in an attempt to take care of the business. It is shipping some very large mining and concentrating equipments to Western States and to Mexico. Recently it built two 100-ton electrically operated cars for handling ore at furnaces and is figuring on several more of this type.

A charter will be asked for on August 16 by W. W. Darley, John Svenson, Frank L. Phillips, S. R. Ireland and E. J. Kent for a corporation to be called the Svenson Engineering Company, which will design, erect and equip manufacturing and industrial plants, mills of all kinds, machinery, engines, &c. The headquarters will be at Pittsburgh, Pa.

The Pittsburgh Smelting & Refining Company has succeeded the Cadwallader Tin Plate & Metal Company, whose works are located at Pittsburgh. The new company will continue the manufacture of terne metals, solders and Babbitt metal, and will deal in pig tin, pig lead, antimony, &c. The officers are William McGee, president; Joseph Cawley, vice-president; F. H. Good, treasurer; R. G. Franz, secretary, and Samuel Hunt, purchasing agent.

The Cary Automatic Couplers Company, 167 Dearborn street, Chicago, has been incorporated with a capital stock of $1,200,000 (preferred $400,000 and common $800,000), to manufacture automatic car and train pipe couplers. Officers of the company are: B. R. Kozlowski, president and general manager; Lewis C. Cary, first vice-president; Edward D. Piper, second vice-president; B. Zaleski, treasurer, and J. P. Zaleski, secretary. The company will have representatives in London, Paris, Berlin, St. Petersburg, Vienna, Brussels, Tokio, Montreal and Mexico City.

At a meeting of the stockholders of the Niles Car & Mfg. Company, Niles, Ohio, it was decided to increase the capital stock of the company from $300,000 to $400,000. The plant is rushed with orders and extensive improvements will be made this summer.

The American Can Company has purchased a site of 15 acres at Newcastle, Pa., and will commence at once the erection of a plant that will give employment to at least 2000 men.

The Mann Street Car Indicator & Advertising Company, Pittsburgh, Pa., capitalized at $5,000,000, has optioned a site at Bandy's Crossing, near Alliance, Ohio, and are considering the erection of a mammoth plant for the manufacture of street car advertising apparatus. P. J. Mann is president; C. A. Hill, Avonmore, Pa., vice-president; A. W. Hargett, Pittsburgh, Pa., secretary; John E. Jones, Pittsburgh, treasurer, and Harry A. Jones, Pittsburgh, legal adviser. The company will manufacture a mechanical sign for the interior of street cars, which will indicate the name of the next street and at the same time display advertising matter that will change at every street.

The Horton Mfg. Company, Bristol, Conn., is building an extensive addition to its plant there and expects to be in the market shortly for shafting and hangers. It will not need much other machinery, as most of the work done by the company is in the way of steel fishing rods and rod mountings, and it will mainly consist of bench work.

The Commonwealth City Street Railway Company has been granted a Pennsylvania charter to operate in Harrisburg, Pa., and will ask a franchise from councils. Its projected line covers 8 miles of streets. J. C. Durbin, Harrisburg, Pa., is president.

The Iron and Metal Trades

The monthly Pig Iron statistics of *The Iron Age* emphasize again the inability of the blast furnaces to increase production. The Coke and Anthracite furnaces made 2,013,402 tons of Iron in July, a month of 31 days, as against 1,976,733 tons in the 30 days of June. The weekly capacity of 294 furnaces active on August 1 was 451,908 tons, as compared with 460,570 tons for 293 furnaces on July 1. Considering the drawbacks of high humidity, the July 4 holiday and the thin linings on which many furnaces are working, the July record is probably better than might have been expected.

It is significant that the Coke and Anthracite furnaces have shown a steady decline in output since the high mark reached in March, when the average daily output was 69,859 tons. In April it was 69,107 tons, in May 67,701 tons, in June 65,891 tons and in July 64,948 tons. More furnaces must be relined, and it does not appear that August will turn the tide.

Foundry Pig Iron markets have carried the advance farther and $14, Birmingham, is now the minimum for Southern No. 2 Iron. Two important Southern producers have withdrawn from the market in the expectation that prices will range higher as the fall demand appears. Furnaces in the Central West are quite well sold for the balance of the year, and the future of the market depends much on whether buyers catch the fever and repeat the familiar feat of bidding for Iron in excess of requirements. Eastern Pennsylvania furnaces have their figures squarely at $18 at furnace for No. 2 Iron. The poor working of furnaces has given a disproportionate supply of lower grades.

In the East the buying of Basic Iron is not over. Inquiries for 25,000 to 40,000 tons are pending for fourth quarter. Some Basic has been taken also for the first quarter of 1907.

Finished material markets, while not sharing in the advances that have attracted attention to Pig Iron, are unusually active for early August. Rail buying is perforce about over for 1906, but for 1907 delivery the Seaboard Air Line has bought 20,000 tons and the Southern Railway has taken 15,000 tons of Bessemer Rails from Northern mills.

The Wire trade has made an astonishing record this summer. The July bookings averaged far beyond those of last July, while August promises even greater things. The capacity of the leading producer is operated to its limit.

In Structural work the principal railroad contract was 5500 tons of Bridges for the Western Pacific. In New York some large work is pending and it is expected the Steel mills will shortly hear from the Manhattan Bridge contractors.

One Western Bar Iron interest has made a $2 advance, now quoting at 1.60c. Pittsburgh.

Further contracts for Shapes and Plates for lake boats were placed last week and the programme of expansion of lake tonnage is still short of the end.

There is already talk of Lake Ore contracts for 1907, and it is intimated that 50c. advance over this season's price may be asked. This would mean $4.50 for Mesaba Bessemer.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 8, 1906.	Aug. 1, 1906.	July 10, 1906.	Aug. 9, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	**$18.75**	$18.50	$18.25	$16.00
Foundry No. 2, Southern, Cincinnati	**17.00**	16.50	16.00	13.50
Foundry No. 2, Local, Chicago	**18.75**	18.75	18.25	16.00
Bessemer, Pittsburgh	**18.85**	18.85	18.10	14.85
Gray Forge, Pittsburgh	**17.35**	17.35	16.35	14.60
Lake Superior Charcoal, Chicago	**19.25**	19.25	19.00	16.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	**27.50**	27.50	27.00	21.00
Forging Billets, Pittsburgh	33.00	33.00	33.00	24.00
Open Hearth Billets, Phila	29.00	29.00	29.00	25.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	32.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	14.00	14.00	14.00	13.00
O. Steel Rails, Philadelphia	**16.75**	16.75	15.75	15.00
O. Iron Rails, Chicago	21.25	21.25	21.25	17.50
O. Iron Rails, Philadelphia	**21.00**	21.00	20.00	18.00
O. Car Wheels, Chicago	18.00	18.00	18.00	14.25
O. Car Wheels, Philadelphia	**16.50**	16.50	16.00	14.00
Heavy Steel Scrap, Pittsburgh	**16.50**	16.50	15.75	14.00
Heavy Steel Scrap, Chicago	13.00	13.00	13.00	12.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.63½
Common Iron Bars, Chicago	1.66½	1.66½	1.66½	1.45
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.55
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.50
Skelp, Sheared Steel, Pittsburgh	1.60	1.60	1.60	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.15
Wire Nails, Pittsburgh	*1.80*	1.80	1.85	1.80
Cut Nails, Pittsburgh	1.75	1.75	1.75	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Copper, New York	**18.62½**	18.50	18.50	15.00
Spelter, St. Louis	**5.90**	5.95	5.85	5.17½
Lead, New York	*5.75*	5.77½	5.80	4.55
Lead, St. Louis	*5.65*	5.65	5.70	4.50
Tin, New York	**39.00**	37.40	36.00	31.40
Antimony, Hallett, New York	23.00	23.50	23.00	13.00
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, Domestic, Bessemer, 100 lb., New York	$3.94	$3.94	$3.94	$3.74

Chicago.

FISHER BUILDING, August 8, 1906.—(*By Telegraph.*)

Further advances on Southern and Virginia grades of Foundry and Steel-making Iron have been recorded during the week, and the sharp upward movement has developed a heavy inquiry for requirements running through the first half of next year. Two of the largest Southern producers with heavy tonnages available for the last quarter have withdrawn quotations, and it is evident that they will not reenter the market until a still higher basis has been established. Virginia furnaces have made another 50 cent advance and are asking the prohibitive price of $19.85, Chicago, for No. 2, while the same grade is held at $14.50, Birmingham, by Alabama producers. Sales for delivery through the year continue heavy, one Implement manufacturer having purchased 8000 tons of low grade Southern Iron, while a Car Wheel interest, which has already purchased 6000 tons of Northern Foundry, is inquiring for its requirements extending through the first six months of 1907. Another large buyer has made inquiry for 10,000 tons for delivery to July 1, while the Grand Crossing Tack Company and the Inland Steel Company are in the market for Basic, the former for 15,000 tons for September to December shipment, and the latter for its first quarter requirements amounting to nearly 25,000 tons. The demand for Spot Iron is heavy, indicating that many consumers have not covered or are not getting the Iron they have purchased. In finished lines the pressure on the mills is without parallel for the midsummer season, this being especially noteworthy in Wire products and Shapes for the implement trade. All new tonnage records in the Wire trade for a summer month were broken during July, and the present month already gives the indication of surpassing the highest point heretofore attained. One Eastern

manufacturer of Steel Bars is quoting $2 a ton above the schedule, having only a limited tonnage for disposal to July next year, while the Republic Iron & Steel Company, on Monday, August 6, announced an advance of $2 a ton on Iron Bars, but similar action has not as yet been taken by the Western Iron mills, nor is a concerted movement probable by these manufacturers as heretofore. Track Supplies for 1907 consumption are being purchased heavily by Western roads, and Cast Iron Pipe manufacturers unable to make shipments on the smaller sizes before November have again marked up quotations 50c. a ton. Buying of Wire and Chain Rods at prices ranging from $33 to $35, Pittsburgh, for forward shipment is heavy, the American Steel & Wire Company continuing a factor in the market despite the shortage of Steel at its own finishing mills. To increase its Steel output the Illinois Steel Company continues in the market for Bessemer Iron, and is picking up all of the odd lots offered.

Pig Iron.—Consumers, believing that they will be confronted with a shortage of Iron during the fall and winter months, continue to cover their needs at advanced prices, and producers with only a comparatively small unsold tonnage on their books are holding for higher values. The Republic-Tennessee interests and the Sloss-Sheffield Steel & Iron Company are still out of the market on the higher grades of Foundry Iron, and other Southern operators are taking advantage of the situation and are moving prices upward. Owing to recent heavy sales of Basic in the East, Virginia furnaces have advanced prices 50c., although $16.50, at furnace, might still be done on a desirable order. Southern Foundry No. 2 is now firmly established on the basis of $14.50, Birmingham, although concessions of 25c. to 50c. are given on off grades. Gray Forge and Mottled Irons, which are quoted at $11.50 to $12, are not on a parity with No. 2 Foundry, due to the heavy accumulation of these grades during the past three months. Northern furnaces are asking $18.75 to $19 for No. 2 Foundry for prompt delivery and $18.25 for first quarter shipment. With Southern operators out of the market on Basic and Valley and Virginia operators practically sold up through the remainder of the year a shortage of Steel making grades is already predicted and further price advances are contemplated. The Illinois Steel Company expects some relief next month when a new stack at Joliet will be blown in and another at the South Works, which is being relined, will be available. In the meantime the Steel works are running short, and all the spot Iron that can be secured is being purchased. In November the Federal Furnace Company of this city will blow in a furnace of 350 tons daily capacity, and another of the same size, which is being built at Mayville, Wis., by the Northwestern Iron Company, will be ready for operation. We quote as follows, f.o.b. Chicago:

Lake Superior Charcoal	$19.25 to $19.50
Northern Coke Foundry, No. 1	19.25 to 19.50
Northern Coke Foundry, No. 2	18.75 to 19.00
Northern Coke Foundry, No. 3	18.25 to 18.50
Northern Scotch, No. 1	19.25 to 19.50
Ohio Strong Softeners, No. 1	19.05 to 19.30
Ohio Strong Softeners, No. 2	18.55 to 18.90
Southern Coke, No. 1	18.40 to 18.90
Southern Coke, No. 2	17.90 to 18.40
Southern Coke, No. 3	17.40 to 17.90
Southern Coke, No. 4	16.90 to 17.40
Southern Coke, No. 1 Soft	18.40 to 18.90
Southern Coke, No. 2 Soft	17.90 to 18.40
Southern Gray Forge	15.90 to 16.40
Southern Mottled	15.40 to 15.90
Malleable Bessemer	18.75 to 19.00
Standard Bessemer	19.55 to 19.80
Jackson Co. and Kentucky Silvery, 6 %	20.30 to 20.80
Jackson Co. and Kentucky Silvery, 8 %	21.30 to 21.80
Jackson Co. and Kentucky Silvery, 10 %	22.30 to 22.80

Coke.—Connellsville and Virginia producers have advanced prices and consignments from both fields for disposal on track have not been received for several weeks. High grade 72-hour Connellsville Coke is held at a minimum of $3 at the ovens, and as high as $3.25 is asked, while Virginia grades are firm at the latter figure. We quote Foundry Coke, Chicago delivery, as follows: Connellsville, $5.65 to $5.80; Wise County, $5.50 and By-Product, $5.60 to $5.85.

Old Material.—The heavy railroad offerings of the past 10 days have not weakened the situation, and the total outcome is being taken by dealers who are confident of higher prices on account of the upward movement of the Pig-Iron market. Purchases to cover short sales are numerous and prices from 25c. to 50c. a ton higher than those quoted below are willingly paid for material for prompt delivery. The Rock Island, Santa Fé and Wisconsin Central railroads have issued lists for the sale of 8000 tons of Scrap, and the Baltimore & Ohio closed yesterday on approximately 7000 tons. Quotations on gross tons, car lots, f.o.b. Chicago, are as follows:

Old Iron Rails	$21.25 to $21.50
Old Steel Rails, 4 ft. and over	15.50 to 16.00
Old Steel Rails, less than 4 ft.	14.00 to 14.50
Heavy Relaying Rails, subject to inspection, 50 lb. and under	27.00 to 27.50
Old Car Wheels	18.00 to 18.50
Heavy Melting Steel Scrap	13.00 to 13.50
Frogs, Switches and Guards	13.50 to 14.00
Mixed Steel	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates	$16.00 to $16.50
Iron Car Axles	22.00 to 22.50
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Railway Springs	13.00 to 13.50
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	11.00 to 11.50
Mixed Busheling	9.00 to 9.25
Iron Axle Turnings	9.00 to 9.50
Soft Steel Axle Turnings	8.75 to 9.00
Machine Shop Turnings	8.75 to 9.00
Cast Borings	7.00 to 7.25
Mixed Borings, &c	7.00 to 7.50
No. 1 Mill	8.25 to 8.50
No. 2 Mill	7.50 to 8.00
No. 1 Boilers, cut to Sheets and Rings	9.00 to 9.50
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.00 to 13.50
Agricultural Malleable	12.50 to 13.00

(*By Mail.*)

Billets and Rods.—Heavy contracts to cover future needs are being placed by Wire mills and Chain makers. The American Steel & Wire Company, notwithstanding the shortage of Steel for its own finishing mills, is selling in the open market on the basis of $33 to $34, Pittsburgh, for Wire Rods and $35 for Chain Rods. The freight to Chicago is $3 a ton. The shortage of Rolling Billets continues acute and the output of local finishing mills is considerably curtailed. Axle Billets on contracts are quoted at $30, f.o.b. Chicago, and for prompt delivery are held at $33. For Forging Billets in small lots the mills are asking $35 to $36 a ton.

Rails and Track Supplies.—As a result of the crowded condition of the order books of Western mills, Eastern manufacturers are already taking on orders from roads in this territory for 1907 delivery, one producer having booked a total of 3000 tons during the week. Premiums are now being asked on Light Rails for prompt shipment, the Illinois Steel Company having its output sold through the next four months. Buying of Track Supplies for next year's delivery continues exceedingly active, at prices which net the mills $4 to $5 a ton more than those at which this year's tonnage was sold. Quotations are unchanged, as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.25c. to 2.35c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, $28 to $29; 25-lb., $30; 20-lb. $30 to $31; 16-lb., $31 to $32; 12-lb., $32 to $33, and lighter sections down to 8-lb., $38 to $40, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Shapes for another lake boat aggregating 1200 tons have been placed with the Illinois Steel Company, and the Great Lakes Engineering Works is negotiating for the Steel for two freighters recently booked. The American Bridge Company was awarded the contract for furnishing the Steel for the new plant of the Union Portland Cement Company, Denver, Colo., aggregating 2000 tons, as well as the requirements of the Van Buren street tunnel, in this city, amounting to 400 tons. Mill shipments continue below specifications, and deliveries are being further deferred. Quotations are firm but unchanged, as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—The Plate requirements for another lake vessel amounting to 3000 tons have been placed with the Illinois Steel Company, and the Great Lakes Engineering Works is in the market for Shape Plates for two boats. The situation on Sheared Plates continues to improve daily, and Western mills are not promising shipments in less than six to seven weeks. Quotations are without change, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 in., 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 in., 1.86½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.20c.; 72 in. wide, 2.35c. to 2.45c.; No. 8, up to 60 in. wide, 2.15c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—On the heavier gauges of Black Sheets some of the independent mills are now securing premiums of $1 to $2 a ton for prompt deliveries, although the pressure on Galvanized is not quite as great. The American Sheet & Tin Plate Company is booked through September, and most of the independent manufacturers are similarly situated. Quotations are firmly maintained as follows: Blue Annealed, No. 10, 1.91½c.; No. 12, 1.96½c.; No. 14, 2.01½c.; No. 16,

2.11½c.; Box Annealed, Nos. 17 to 21, 2.41½c.; Nos. 22 to 24, 2.46½c.; Nos. 25 and 26, 2.51½c.; No. 27, 2.56½c.; No. 28, 2.66½c.; No. 29, 2.81½c.; No. 30, 2.91½c. Galvanized Sheets, Nos. 10 to 14, 2.61½c.; Nos. 15 and 16, 2.81½c.; Nos. 17 to 21, 2.96½c.; Nos. 22 to 24, 3.11½c.; Nos. 25 and 26, 3.31½c.; No. 27, 3.51½c.; No. 28, 3.71½c.; No. 30, 4.21½c. Sheets from store: Blue Annealed, No. 12, 2.15c. to 2.25c.; No. 14, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Box Annealed, Nos. 18 to 20, 2.60c. to 2.70c.; Nos. 22 to 24, 2.65c. to 2.75c.; No. 26, 2.70c. to 2.80c.; No. 28, 2.85c. to 2.95c.; No. 30, 3.25c. to 3.35c. Galvanized from store: Nos. 10 to 20, 3.10c. to 3.20c.; Nos. 22 to 24, 3.35c. to 3.45c.; No. 26, 3.45c. to 3.55c.; No. 27, 3.55c. to 3.75c.; No. 28, 3.85c. to 3.95c.; No. 30, 4.45c. to 4.55c.

Bars.—On Monday, August 6, the Republic Iron & Steel Company announced an advance of $2 a ton on Iron Bars, and is quoting on the basis of 1.60c., Pittsburgh, although independent manufacturers continue to maintain prices on the old basis of 1.50c. It is probable, however, that the latter will follow the lead taken by the largest producer, and a similar advance by these mills is anticipated shortly. As consumers are beginning to specify Iron Bars owing to their inability to secure Steel, this action undoubtedly was due, although the railroads have been buying freely during the past two weeks and the general situation is materially improved. Specifications for Steel Bars from implement makers are unusually heavy, and as the operating capacities of their plants will increase during the fall months a still heavier consumption is anticipated. A large Eastern interest, which has only a small tonnage available to July next year, is already asking a premium of $2 a ton, and is quoting on the basis of 1.60c., Pittsburgh. Contracts are now being made for Hoops and Bands for forward shipment at prices now prevailing. Quotations are as follows: Iron Bars, 1.66½c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—While Western jobbers are not buying to cover future needs their orders for material for prompt delivery are unusually heavy and are indicative of a record breaking trade during the fall months. Quotations continue on an exceedingly low basis, and owing to the high prices ruling on Skelp some of the independent manufacturers are eager for advances on the finished product. Sales continue to be made on the basis of 81 and 5 off the list, Pittsburgh, and discounts in car lots, Chicago, are as follows: Black Steel Pipe, 79.35 per cent. on the base sizes, ¾ to 6 in., and Galvanized, 69.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 in.

Boiler Tubes.—Heavy specifications and some new orders are being received from Western roads, and the irregularity in prices noted some time ago has almost entirely disappeared. Mill quotations are well maintained, as follows, on base sizes, 2¾ to 5 in., in car lots: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35: 2½ in. and smaller and lengths over 18 ft., and 2½-in. and lengths over 22 ft., 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	40	35	42½
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	30
2¾ to 5 in.	60	47½	42½
6 in. and larger	50	35	..

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company this week announced an advance of 50c. a ton on all sizes, due to the increased cost of raw materials and the crowded conditions of its foundries. On the smaller sizes of Pipe this company cannot make shipments before November. Awards for the 1906-07 requirements of Kansas City, Mo., amounting to 5000 tons, will be made in a few days, bids having been opened last week. We revise quotations as follows: Water Pipe, 4-in., $33; 6, 8, 10 and 12 in., $32; over 12-in., $31, with $1 extra for Gas Pipe.

Merchant Steel.—The midsummer activity of Western implement plants has resulted in the placing of heavy specifications with the mills, one large Eastern interest having received shipping instructions during July for a larger tonnage of material from this district than during any like period in its history. Shafting prices continue irregular, but the extreme low point amounts to only a few dollars below agreed prices and is only allowed by the mills on desirable orders. Quotations are unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish, up to 1½ x ½ in., 1.81½c.; Iron Finish, 1½ x ½ in. and larger, 1.66½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.16½c., and 1⅛-in. and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

Metals.—The unusual feature of the week is the sharp advance of Pig Tin, and prices have not only passed the 40c.-mark again, but are quoted 2c. to 3c. higher than this. Foreign speculators are held responsible for this upward movement, and even higher prices are anticipated. Copper continues strong, but with little current business taken from the domestic trade. We quote: Casting Copper, 18¾c. to 18⅞c.; Lake, 18⅞c. to 19¼c., in car lots; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 42c. to 42½c.; small lots, 43c. to 43½c.; Spelter, prompt delivery, 6.20c. to 6.30c., for car lots; Lead, Desilverized, 5.90c. to 6c., for 50-ton lots; Corroding, 6.57½c. to 6.67½c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Cookson's Antimony, 28c., and other grades, 26c. to 27c.; Sheet Zinc is $7.75 list, f.o.b. Laselle, in car lots of 60-lb. cask. On Old Metals we quote: Copper Wire, 16¾c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 15¾c.; Red Brass, 15½c.; Red Brass Borings, 13¾c.; Yellow Brass, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8¾c.; Lead Pipe, 5½c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 24c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

Philadelphia.

REAL ESTATE TRUST BUILDING, August 7, 1906.

The experience of the last two or three weeks in the Pig Iron market is probably something new to even the oldest inhabitant. The excitement still continues in a mild form, but it will doubtless die out in the course of a few weeks, as there is really no need for its continuance. Makers of Pig Iron have sold at least two-thirds of all they can turn out during the next eight or nine months, which of course implies that consumers have provided for their wants to the same or a greater extent, leaving very little more business to come on the market from either large buyers or large sellers. Consumers cannot increase their capacity to any great extent during 1906, and in fact many thousands of tons have been sold to mills and foundries that do not expect to be in operation until 1907. The most important feature during the remainder of the year will therefore be the furnace output. It was confidently predicted by high authorities early in the year that by midsummer the capacity would be at least 2,500,000 tons per month, but the recent showing is that 2,000,000 is about all that can be done. If it is shown during the next few weeks that production is increasing then there may be hopes of a full supply, but unless better than 2,000,000 per month was done during July there may be some grounds for anxiety. Meanwhile everything is being run to fullest capacity, with the exception of the Bar mills, some of which are closed on account of strikes.

Pig Iron.—The market is very sensitive, but it looks as though the Steel makers had pretty well covered for their requirements during the balance of the year. The run is now on Foundry grades, in which prices show wide divergence. This is due to the fact that the trade is less concentrated than it is in Basic Iron. There are all kinds of buyers and there are all kinds of sellers, and while one may be satisfied with $18.75 from a good consumer for No. 2 X Foundry another may want $19 or $19.25, all of which figures have been quoted to-day, and the high priced men say they have nothing for sale at less money. The fever is on and if people insist on buying for forward delivery it may carry prices to still higher figures. Conservative people are satisfied to meet the market moderately at $18.75 to $19, but if too much business is pushed their way they will doubtless begin to discriminate what to take and what not to take. It is one of those markets whose movements it is impossible to anticipate; it may go higher, or it may come to a dead stop at to-day's extreme figures. Consumers are very clamorous, however, not only to place new business, but to anticipate shipments on what has been bought. September Iron is wanted this month, and so on all the way through the list. The writer, who has been in the closest touch with the market for more than 30 years, never saw anything to parallel present conditions, so that with the new records which are constantly made it is useless to attempt forecasts in regard to the future. For the present, however, the range of quotations for Philadelphia and nearby deliveries would be about as follows:

No. 1 X Foundry	$19.50 to $19.75
No. 2 X Foundry	18.75 to 19.25
No. 2 Plain	18.25 to 18.75
Standard Gray Forge	16.75 to 17.00
Ordinary Gray Forge	16.25 to 16.50
Basic	17.90 to 18.00
Low Phosphorus	24.50 to 24.75
Malleable	19.00 to 19.25
Bessemer	20.00 to 20.50
Lake Superior Charcoal	21.00 to 22.00

Steel.—The demand is fully maintained and prices are strong as last quoted, namely, $29 to $29.50 for ordinary Open Hearth Billets, and $32.50 to $33 for Forging Billets.

Steel Alloys.—The market is unsettled and impossible to quote with much exactness. Ferrosilicon would bring $93 to $98, according to delivery, and 50 per cent. Ferro-

manganese $80 to $82.50 for last quarter, or $88 to $90 for August or September, and Spiegeleisen, $35 to $36.

Finished Material.—There is no change from last week's prices in any of the specialties usually quoted in detail, although the feeling is very strong. The Plate mills are crowded with work and will doubtless break all records in production during the last half of the year. Orders are coming in from all parts of the country, showing that prosperity is not confined to any one interest or to any one district. The same remarks would apply to the Structural mills, which in point of tonnage will surpass all former records. The Bar trade is interfered with by local strikes and much of the business which properly belongs to the Eastern mills is going elsewhere; but there is plenty of business in sight, which will be placed when the men are ready to go to work

Old Material.—The market is very strong and prices look like going higher. There is a big demand, bids and offers for deliveries in buyers' yards being about as follows:

Steel Crops	$16.75 to $17.00
No. 1 Steel Scrap	16.50 to 17.00
Low Phosphorus Scrap	20.50 to 21.50
Old Steel Axles	20.50 to 21.00
Old Iron Axles	27.00 to 28.00
Old Iron Rails	21.00 to 22.00
Old Car Wheels	16.50 to 17.00
Choice Scrap, R. R. No. 1 Wrought	19.50 to 20.50
Choice No. 1 Yard Scrap	17.50 to 18.00
Long and Short	15.00 to 16.00
Machinery Scrap	16.00 to 16.50
Wrought Iron Pipe	14.00 to 14.50
No. 1 Forge Fire Scrap	13.50 to 14.00
No. 2 Light Ordinary	10.00 to 11.00
Wrought Turnings	12.50 to 12.75
Axle Turnings, Choice Heavy	13.00 to 13.50
Stove Plate	11.50 to 12.00
Cast Borings	10.00 to 10.50

Cleveland.

CLEVELAND, OHIO, August 7, 1906.

Iron Ore.—The movement of Iron Ore down the lakes for the month of July was 5,762,772 tons, against 5,224,620 for the corresponding month a year ago, showing an increase therefore of 538,152 tons. The movement up to August 1 this year amounted to 17,004,368 tons, against 16,038,674 for the corresponding period a year ago, showing an increase of 965,694 tons. The season is now practically half over, and if the same ratio of increase should be continued it might be possible to move this year a little over 36,000,000 tons of Ore from the head of the lakes. It will be extremely difficult, however, for the various interests engaged in the movement or Ore to increase their speed or even to maintain it during the remainder of the season. July this year makes a new record movement, but the increase over last year is by no means in proportion to the increase in carrying capacity. It does little more than utilize the excess capacity of a year ago. Nor is it in proportion to the betterment of the unloading facilities at the lower lake ports. From recent developments in the labor situation in the Northwest it is plain that the failure to make a much greater increase in the movement is traceable directly to the inability of the mines to produce Ore faster. On Sunday there were in Cleveland, several agents of Ore companies trying to hire miners, but it was found practically impossible to get together 200 men in this territory, which was the number desired. Another complication is arising in the fact that boats are in such strong demand in other trades that it will be out of the question for the remainder of the year to devote much wild tonnage to the Ore trade. It is quite possible that a liberal scaling down of the estimated movement for the year will have to be made. Shippers agree that it is impossible to approach the 38,000,000-ton mark set at the beginning of the season. There is no fear of a shortage of Ore, however, as the stocks on the Lake Erie docks are large, some piles not having been disturbed for years. Much of this Ore is high grade. For the present lake rates are steady at 75c. from Duluth to Ohio ports, 70c. from Marquette and 60c. from Escanaba. Ore prices are not changed, except that premiums are being paid for high grade.

Pig Iron.—There is such a shortage of Foundry Iron for spot shipment in this territory that it is almost impossible to supply the urgent demand of some shippers. One consumer has been offering an order for 1000 tons around among the furnaces without finding any combination of makers able to take care of the business. The available supply in southern Ohio and in the Buffalo District seems to have been sold up. No Iron is offered for less than $18.50, delivered, although the nominal quotation is $17.50 to $17.85, at Valley furnace, for No. 2.

Finished Iron and Steel.—Announcement is made that another order for a 10,000-ton Steel ship has been placed with the American Shipbuilding Company. In fact, the contract was placed 30 days ago, and is just now announced. This development tends to confirm rumors which have been abroad for some time that there are many orders on the books of the American company which have not been made public. The statement was made some time ago that the company had sold up all of its berths for the year ending with July 1, 1907. The company, in addition to boats now under construction, has 19 new boats under contract. Its productive capacity is much greater than that, since the average time for building a boat, on the stocks, is between 8 and 10 weeks. It is of some importance that the company is said to have made arrangements for the supply of Shapes and Plates, which enter into this construction. The demand for Bar Iron is still strong; in fact, it is beginning to be a problem to supply the demand. This was somewhat relieved yesterday, when the new Bar Iron mill of one Cleveland company began operations. For the time this will have a productive capacity of 100 tons a day, which will be increased a little later. The association price is still 1.50c., Pittsburgh, but it is realized that this is strictly nominal, as the actual price would be closer to 1.60c., Pittsburgh, were there any sales. Forging Billets are scarce, commanding $34 to $35, Cleveland. Sheets are still strong, the mills being about a month behind their orders. Sales out of stock are made at 2.15c. for No. 10 Blue Annealed, 2.85c. for No. 28 One Pass Cold Rolled, and 3.85c. for No. 28 Galvanized.

Old Material.—The Scrap market is dull and about steady, but with a little better buying movement promised. We quote dealers' prices to the trade, f.o.b. Cleveland, gross tons: Old Steel Rails, $15; Old Iron Rails (nominal), $21 to $22; Iron Car Axles (nominal), $18.50 to $19.50; Heavy Melting Steel, $15. Net tons: Cast Borings, $8; No. 1 Busheling, $12.50 to $13; No. 1 Railroad Wrought, $15.50 to $16; No. 1 Cast, $14.50; Iron and Steel Turnings and Drillings, $9.50 to $10.50.

Cincinnati.

FIFTH AND MAIN STS., August 8, 1906.—(*By Telegraph.*)

Pig Iron.—The indication of higher prices that last week appeared no larger than a man's hand has now overspread the entire horizon, and the whole situation is conceded to be one of exceptional strength and firmness. Sales of all grades have been made quite freely covering an extended period. Northern furnaces are said to be practically out of the market for the remainder of the year, having a very small tonnage unsold, while the Southern producers are apparently showing slight disposition to push sales at present prices. Several of the latter are said to be in no position to quote to any great extent, being satisfied with taking care of regular customers in a small way. There is a noticeable demand for spot shipments both on contracts and also new orders, which under present conditions is a difficult proposition, especially in the higher grades. Lower grades are said to be more plentiful but in less demand. As foreshadowed last week, practically all Southern Iron obtainable below $14, Birmingham, has disappeared, and to-day it is safe to say that no strictly Birmingham Iron can be bought below this figure, which probably represents as nearly as can be obtained the ruling quotation of to-day. There are indications, however, that a few sales have been made at an advance of 50c. over this figure, which would make No. 2 quotable from $14 to $14.50, Birmingham. Northern brands have also advanced 50c. with No. 2 quotable from $17 to $17.50 at furnace. Quite a large percentage of the tonnage sold during the week has been for shipment during the first quarter of 1907, and inquiry covering this period is strong and well offered. One of the large agricultural concerns bought 15,000 tons of Standard Bessemer during the week at about $18, Valley furnace. They are no special inquiries reported excepting in the way of number of small lots, aggregating considerable tonnage, although it is rumored that one or two large consumers are feeling the market with a view of entering at the first desirable opening. Freight rates from Hanging Rock district to Cincinnati are $1.15, and from Birmingham $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$17.50 to $18.00
Southern Coke, No. 2	17.00 to 17.50
Southern Coke, No. 3	16.50 to 17.00
Southern Coke, No. 4	16.00 to 16.50
Southern Coke, No. 1 Soft	17.50 to 18.00
Southern Coke, No. 2 Soft	17.00 to 17.50
Southern Coke, Gray Forge	15.25 to 15.50
Southern Coke, Mottled	15.00 to 15.25
Ohio Silvery, No. 1 (8 per cent. Silicon)	22.15 to 22.65
Lake Superior Coke, No. 1	18.65 to 19.15
Lake Superior Coke, No. 2	18.15 to 18.65
Lake Superior Coke, No. 3	17.65 to 18.15

Car Wheel Irons.

Standard Southern Car Wheel	$24.00 to $24.25
Lake Superior Car Wheel	22.50 to 22.75

Coke.—The market is strong, prices showing a slight advance. The demand appears to have eased off to some extent, which is perhaps fortunate, as reports indicate some stricture in the car supply. We quote the best grades of Connellsville and Virginia Foundry brands from $3 to $3.25, f.o.b. ovens.

Finished Iron and Steel.—The situation is apparently growing stronger and new work is coming forward in good shape. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.68c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-in. and heavier,

1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.83c. in carload lots.

Old Material.—The market for Scrap is showing some improvement and the railroads are disposing of their lists at present prices. We quote dealers' prices, f.o.b. Cincinnati, about as follows: No. 1 Railroad Wrought Scrap, $14 to $14.50 per net ton; Cast Borings, $5 to $6 per net ton; Steel Turnings, $7 to $8 per net ton; No. 1 Cast Scrap, $12 to $13 per net ton; Iron Rails, $19 to $20 per gross ton; Steel Rails, rolling mill lengths, $15 to $15.50 per gross ton; Relaying Rails, 56-lb. and upward, $28 to $29 per gross ton; Iron Axles, $21 to $22 per net ton; Car Wheels, $17 to $18 per gross ton; Low Phosphorus Scrap, $17 to $18 per gross ton.

Birmingham.

BIRMINGHAM, ALA., August 6, 1906.

Pig Iron.—With a number of producers out of the market sales the past week have necessarily been light. The large companies are still refusing to quote, and the smaller ones have now booked about all they care to take at present prices. All the Nos. 1 and 2 Soft Iron that can be produced here for the next 60 days has been sold, and it is estimated that there is now less than 10,000 tons of Foundry Iron in the furnace yards in the Birmingham District. No sales have been reported at less than $14 on a No. 2 Foundry basis, and a few orders for small lots have gone at $14.50. Work on all stacks out of blast is being rushed, and the production of Iron should be largely increased within the next 30 days. The Woodstock Iron Company, at Anniston, has a force of men getting its furnaces and Coke ovens in shape, but no information has been given out as to its intentions. This company has two stacks with a daily capacity of about 200 tons each. The new furnace of the Alabama Consolidated, at Gadsden, is rapidly nearing completion, and the No. 5 furnace of the Tennessee Company, at Ensley, which will have a daily capacity of 400 tons, will soon be making Iron.

Cast Iron Pipe.—A number of inquiries this week for small lots have been turned down, owing to the inability of foundries to make deliveries under three to four months. While the manufacturers here are booked well ahead on all sizes, the smaller sizes seem to be in more urgent demand and deliveries are further behind than on the larger. Prices on Water Pipe are firm and are about as follows, f.o.b. cars here: 4 to 6 in., $28; 8 to 12 in., $27.50; over 12-in., $26. Gas Pipe $1 per ton extra.

Old Material.—Many foundries, which have heretofore used no Scrap in their mixtures, are now in the market for Cast, on account of inability to get Pig Iron. This has had considerable influence on the Scrap market, and the dealers report a scarcity of that grade. Inquiries from rolling mills are more numerous, and there is a decidedly better feeling in the market. Dealers' quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$18.50 to $19.00
Old Iron Axles	18.00 to 18.50
Old Steel Axles	16.00 to 17.00
Old Car Wheels	16.50 to 17.00
No. 1 Railroad Wrought	15.00 to 15.50
No. 2 Railroad Wrought	14.00 to 14.50
No. 1 Country Wrought	13.00 to 13.50
No. 2 Country Wrought	11.00 to 11.50
Wrought Pipe and Flues	11.50 to 12.00
Railroad Malleable	12.00 to 12.50
No. 1 Steel	11.00 to 11.50
No. 1 Machinery Cast	11.00 to 11.50
Stove Plate and Light Cast	8.50 to 9.00

President Flynn has called a special convention of District No. 20 United Mine Workers of America, to be held in Birmingham on August 14. No information relative to the purpose of the convention is to be had, but it is reported that it will call off the strike which has been in progress for the past two years. It is understood that National Presiden Mitchell favors discontinuing the strike, but President Flynn refuses to discuss the matter. There are now about 5000 union miners in the district who have been drawing support from the national organization since July, 1904.

It is announced that a special meeting of the stockholders of the Southern Steel Company will be held on September 1 for the purpose of voting to increase its capital stock from $16,000,000 to $21,000,000. The increase is to consist of $5,000,000 of common stock. Notice has also been given that at the same meeting the consent of the stockholders will be asked to the sale of $4,000,000 additional preferred stock, making the total preferred stock $10,000,000. It is believed that the pending negotiations for a consolidation of the Southern Steel Company, the Lacey-Buek Iron Company and the Chattanooga Iron & Coal Company will be definitely settled at this meeting, though authentic information is unobtainable.

The second annual convention of the National Association of Master Sheet Metal Workers opened on August 8 in Indianapolis, Ind., for a three days' session.

The German Iron Market.

BERLIN, July 27, 1906.

The Steel Verband held a meeting a week ago, which attracted unusual attention throughout the Iron trade, since application had been made to the management to order another advance of 5 per cent. in the price of half-rolled goods. It had been asserted with apparent authority in the daily press that the advance would go through, and this view was pretty generally accepted in the trade. However, the managers disappointed expectations. They left prices unchanged, and issued instead a statement of their reasons for doing so. They point out that moderate prices are the best guarantee for the continuance of the present prosperous condition of the trade. The managers do not doubt that a price advance would have had a stimulating effect upon the market, and it would probably have hastened the development that is to be expected; but they express the fear that such an upward movement in the course of the summer might lead to a reaction. The Verband says that it regards its mission to be to prevent a too rapid advance of prices in times like these, as well as to hinder a too rapid fall in times of poorer business.

While the Verband refused to advance prices, it raised allotments in Bars by 5 per cent., taking effect from August 1. A petition for the increase of allotments in general rolled goods was voted down, and the sale of half rolled material for the fourth quarter was declared open. The usual monthly report of the Verband upon the state of the trade is in about the same strain as previous utterances of this kind, but with an increasing tendency toward optimism. Inquiries for half rolled goods for the December quarter have arrived in such quantities as to guarantee a very large volume of business. The various works are extraordinarily busy. Export business, however, is somewhat quieter. The Verband continues its policy of restricting foreign sales of half rolled material in favor of home consumers; but in Steel Rails some large foreign orders have been taken at good prices, while other contracts are under consideration. The foreign Rail market is described as very strong. In Rails for mines business is also very good, three to seven months being required by the mills for delivery. Mills running on street Rails are all busy into next year. In Structural Material specifications are arriving from both foreign and home markets in large volume; supplies are no longer on hand, and buyers must reckon upon long periods of delivery. Stocks of dealers are being drawn upon for immediate delivery; and it is believed that the mills will be kept busy on Structural Material in the autumn and winter, to replenish those stocks for the spring trade. The Verband sees no reason for beginning sales of Structural Steel for the December quarter.

Price advances continue to be announced in a rather irregular way. The Wrought Iron Association last week raised prices 5 to 152 marks. A small advance was also made several days ago in Boiler and Gas Piping. Manufacturers of electric motors and gas engines have just marked up the prices of medium sized and smaller machines by 5 per cent., while some other kinds of machinery were advanced 10 per cent. An effort is on foot to raise the price of Rivets and Screws by 5 or 10 per cent. Band Iron has been marked up from 140 to 142.50 marks for lots of 50 tons and more, and 145 marks for smaller lots. The most recent auction sales of Old Metal show rising prices.

All departments of the Iron trade continue in a most prosperous condition. The scarcity of Pig Iron and Steel Material is apparently growing more troublesome; and some companies are unable to secure adequate Ore supplies. One great company in the Rhenish-Westphalian District can get no more Swedish Ores. The city of Dortmund is enlarging the harbor facilities at the terminus of the Dortmund-Ems Canal, and is building a municipal railroad to two of the great Ironworks in the vicinity. It is expected that these measures will greatly increase the movement of Swedish Ores on the canal. A general organization of Ore owners and operators was effected about a week ago with a view to the scientific investigation and exploitation of Ore deposits. It is not a trade association.

Of American orders little has been heard for several weeks. Last week, however, a purchase of 10,000 tons of Spiegeleisen for delivery in the December quarter was reported from the Siegen District. The strength of the American Iron market continues to give great encouragement to the German trade.

The dissolution of the Wire Nail Association has been followed by the announcement that the Steel Verband has suspended the 5 marks bounty that it had been hitherto paying on exported Nails. Sensational reports of price cutting since the disruption of the association have found their way into the press; but manufacturers assert that prices are fully maintained.

The scarcity of Coal is felt still more severely than a fortnight ago. Cars are supplied in insufficient numbers, and some of the collieries are compelled to throw off an occasional shift of miners, while others have now and then to dump a part of their output.

Pittsburgh.

PARK BUILDING, August 1, 1906.—(*By Telegraph.*)

Pig Iron.—The market is stronger in every respect than at any previous time this year, as all grades partake equally of the strength. There is a genuine famine in Foundry, and predictions are made that it will cross Bessemer and pass $20 before the end of the year. The absolute minimum on Bessemer Pig for this year is $18, Valley furnace, while $18.25 has been obtained on lots of 1000 tons for September. We note sales since last report aggregating 20,000 to 25,000 tons of Valley Bessemer for this year, more than half of which was taken by one local interest. Several Steel works would like to buy more Bessemer for this year, but will hardly be able to get what they want. To act on a large inquiry for first half by an Ohio interest which finds it will need 10,000 tons monthly additional Iron, the Bessemer Furnace Association met in Cleveland on Monday and found it would have 120,000 to 125,000 tons available for first half. It fixed the price of $17.75, Valley furnace, on this Iron, and some large sales for first half will probably be made by the association and other interests on this basis within a fortnight. Basic is very scarce and firm at $17.50 to $17.75, Valley furnace. Conditions approaching panic exist among buyers of Foundry Iron, as prompt deliveries are almost unobtainable. We note sales to large consumers aggregating over 15,000 tons of Southern Foundry for prompt shipment on basis of $15, Birmingham, for No. 2, equaling $19.60, delivered, Pittsburgh, which indicates the very unusual conditions prevailing. For later delivery $14, Birmingham, is minimum. The Westinghouse Machine Company, which recently bought 6100 tons for fourth quarter, has bought 5000 tons for first quarter next year. The Westinghouse Electric Company has bought 1000 tons or more for prompt Cleveland delivery. Others have bought liberally. For late delivery we quote No. 2 Foundry minimum $17.50, Valley furnace. Lots of 50 and 100 tons have sold freely at $18, Valley furnace, and single carloads brought higher figures. Forge is $16.50 to $17, Valley furnace, depending on delivery.

Steel.—The scarcity is more pronounced, and consumers are importuning mills for deliveries more in accord with contracts. Odd lots of Bessemer Billets can be bought at $27.50, Pittsburgh, and Open Hearth $28 to $29, but not on all specifications. Sheet Bars are $29, Pittsburgh.

(*By Mail.*)

August promises to be a relatively quiet month in Finished Steel products, just as July was an abnormally active one. There are promises of renewed activity in September, and large Steel manufacturers feel fairly confident of a continuance of the present strength until next midsummer, which is as far ahead as they ever look. It is stated that the large Steel car builders are in receipt of inquiries for about 20,000 all-Steel and Steel underframed cars, from roads well distributed over the country, while the local Rail interest received inquiries last week for about 100,000 tons of Standard Rails. In both instances delivery would be in 1907, while on account of the practice of submitting such purchases to the directors it may be 30 days or more before contracts are finally closed, as it is difficult to get full meetings this month. The Carnegie Steel Company has bought about 5000 tons of Heavy Melting Scrap for delivery at Munhall during August, taking it in 1000-ton lots from different dealers, and paying $16.50, or 50c. more than it paid for its July Scrap. There is almost a famine in Pig Iron for any early delivery, Foundry Iron having become almost as scarce as Bessemer, and as high as $18, Valley furnace, has been paid for 50 and 100 ton lots of No. 2 for delivery within 30 days. The scarcity is due largely to so many furnace linings in the Valleys having played out at once, Girard, Fannie, Youngstown Steel, Shenango No. 4 and Brier Hill all being out for relining at the present time. An interesting feature of the Foundry Iron situation is that a number of inquiries are out for first quarter Iron, but in such cases furnacemen suspect that the consumers are not covered fully for this year but are inquiring for first quarter in hopes of getting better prices and having some of the shipments anticipated. They are therefore indisposed to make any concessions on the late delivery. Bessemer and Open Hearth Steel continue very scarce. The Youngstown Sheet & Tube Company expects to blow its first heat on August 20. The market has felt no relief from the building of this plant, nor from the general tendency of consumers to build small steel plants. The Colonial Steel Company has completed a small open-hearth steel plant, the Follansbee Bros. Company is building one, and the Percy Donner project is believed certain of being carried out. In other districts small steel plants are being built, and others are in contemplation.

Ferromanganese.—The market is firm and higher, material being very scarce. For prompt delivery we quote $90 to $95, and for deliveries September to the end of the year $80 to $85.

Muck Bar.—The market is firm, owing to the scarcity and high price of Forge Pig, and we quote $29.50, Pittsburgh, for prime all Pig Muck.

Wire Rods.—Deliveries are somewhat hard to get, as Steel is scarce, and Wire prospects for the fall are very good. We quote Bessemer and Open Hearth Rods at $34, and Chain Rods at $35, Pittsburgh.

Skelp.—Specifications are good, and a moderate amount of new tonnage is being placed. We quote prices firm as follows: Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Material.—The only very large business this month is the buildings for the Rail mill at Gary, which was to have been placed last month. A number of small jobs are coming up in this district. Mills are well filled for the rest of the year. We quote prices firm and unchanged, as follows: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—Nearly all the Plates for the 11 lake freighters recently contracted for have been placed with mills. It is desired to have all these boats in commission at the opening of lake navigation next year, and specifications will come in promptly. Universal Mill Plate deliveries are about two months behind, while Sheared Plates can hardly be had inside of 30 days or more. We continue to quote: Tank Plates, ¼ in. thick, 6¼ in. up to 100 in. in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—While new buying is not as heavy as it was specifications are very good, and mills are not making as good deliveries as they would like, as they cannot in many instances get sufficient Steel. There is no sign of any easing up in the Steel supply this year, and an advance in Sheets is looked for. Prices are very firm, as follows: Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.65c., and No. 30, 2.75c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.80c., and No. 30, 4.05c. We quote No. 28 Gauge Painted Roofing Sheets at $175 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $3.10 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Bars.—Some new tonnage is being booked in Iron Bars, and the mills are now charging 1.55c. for delivery at Pittsburgh, still quoting 1.50c., Pittsburgh, for shipments to a distance. Steel Bar specifications are very good, and a moderate amount of new business is being placed. The price remains firm at 1.50c., Pittsburgh.

Hoops and Bands.—Specifications continue good. We quote Steel Hoops at 1.90c. and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—The demand for prompt tin plate is very much better than it was in July, more inquiries being received since the first of this month than during the whole month of July. Most consumers are inquiring for smaller quantities and deliveries for a shorter period ahead than they usually do, and it is thought that they are not convinced that the market this summer is a different one from that experienced last summer and the summer before. Reports are circulated of prices being cut, but these are not taken seriously, and mills believe that when buyers recognize the strength of the situation they will buy very freely.

The scarcity and high price of Steel are seriously interfering with operations. One of the large independent tin mills closed 10 days ago and will not resume until the latter part of this month, while another, shut down since July 1, will not start until September, when it expects to have a more trustworthy Steel supply. The leading interest is now operating only a trifle over 71 per cent. of its Tin Plate capacity, but its average rate of production since July 1 has nevertheless been somewhat larger than the average during June. The independents are operating to about the same percentage as the leading interest. We quote Tin Plate at $3.75 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which prices a rebate of 5c. a box is allowed for carloads and larger lots.

Railroad Spikes.—The demand is very good, contracts being placed for next year. Producers are filled for the next two or three months and early deliveries are hard to secure at the regular prices, which we continue to quote at $2.20 to $2.25 per 100-lb., f.o.b. Pittsburgh.

Merchant Steel.—The agricultural implement makers continue to specify very freely. The Shafting situation is reported as much better, the shading being confined to very desirable orders, while not so long ago the official prices were practically a dead letter. We quote: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finished, up to 1½ x ½ in., 1.65c., and Iron Finish, 1½ x ½ in. and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 in., 2c., and 1⅛-in. and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.75c. to 1.80c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Spelter.—The demand is very slack, there being very few inquiries this week, but the market remains firm, at about 5.85c., St. Louis, equal to 5.97½c., Pittsburgh. A bid of 6c., Pittsburgh, was made to-day for spot shipment.

Merchant Pipe.—The demand for Merchant Pipe is very good, and some of the independent mills are filled up completely for 30 days or more, while they have a great deal of business for several months ahead. While surface conditions continue to warrant an advance, the trade has almost given up looking for one. We quote the extreme discount on Merchant sizes of Steel Pipe at 81 and 5 per cent. off, to the large trade. Official discount for carloads, which continue to be shaded one point or more, are as follows:

Merchant Pipe.

	Jobbers, carloads.			
	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	%	%	%	%
⅛ and ¼ in.	72	56	69	53
⅜ in.	74	60	71	57
½ in.	76	64	73	61
¾ to 6 in.	80	70	77½	67½
7 to 12 in.	75	60	72½	57
Extra strong, plain ends:				
⅛ to ⅜ in.	65	53	62	50
½ to ¾ in.	72	60	69	57
1 to 8 in.	68	56	65	53
Double extra strong, plain ends:				
½ to 8 in.	61	50	58	47

Boiler Tubes.—The demand is only fairly good, and there is a little unevenness in prices where the orders are very desirable. On carload lots we quote official discounts as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	45	50
1¾ to 2¼ in.	45	62
2½ in.	50	64
2¾ to 5 in.	57	70
6 to 13 in.	45	62

Iron and Steel Scrap.—The Carnegie Steel Company has bought about 5000 tons of Heavy Melting Scrap for August delivery at Munhall (Homestead Steel Works) at $16.50 delivered, taking 1000-ton lots from several dealers. This is 50c. advance over the price paid for somewhat larger tonnages for July delivery. Dealers are considering the possibility of further purchases, but these are not likely for August delivery. The Steel Corporation has not bought Pig Iron for later delivery and may not be willing to pay the prices now asked and actually paid, so that it is not unlikely it may make further scrap purchases for September. Other consumers of Heavy Melting Scrap are not anxious, one bidding $15.75 and another $16, while dealers would not sell any fair sized lot at under $16.50 delivered. They are bidding $16 quite freely against their short contracts, on odd lots that come up. One of the prominent dealers, who did not sell to the Carnegie Steel Company, is asking above $17 on Heavy Melting Stock. A small lot of Rail Crops was sold at $18 to a consumer who could not use any longer material. A local consumer has been in the market for 1500 to 2000 tons of Low Phosphorus Scrap, and it is said that $19 has been quoted, while some dealers would not shade $20 to get the order. We quote prices on other grades of **Scrap as follows:** Bundled Sheet Scrap, $13.75 to $14; No. 1 Wrought Scrap, $17.25 to $17.50; Machinery Cast Scrap, $15.50; Cast Iron Borings, $9.00; Old Steel Rails, short pieces, $16.00; Old Steel Rails, rerollers, $17.25 to $17.50; Axle Turnings, $12.50; Stove Plate, $10.25 to $10.50; Wrought Turnings, $11.50 to $11.75—all in gross tons, f.o.b. Pittsburgh.

Coke.—The scarcity of labor in the Coke regions continues and the market is very firm, it being difficult to buy at any price. Some of the operators making Foundry Coke chiefly are sold up through the year. We quote strictly Connellsville Furnace Coke at $2.75 and 72-hr. Foundry at $3 a ton, at oven. The output of Coke in the Upper and Lower Connellsville regions last week showed a material falling off over the previous week.

New York.

NEW YORK, August 8, 1906.

Pig Iron.—While the volume of business is not large the market shows steady buying of Foundry Iron, and probably 15,000 to 16,000 tons of various grades have been taken in the past week. The largest transaction was 4800 tons bought by a soil pipe company, and a New England buyer took 2600 tons. The buying of Basic Iron in eastern Pennsylvania seems not to be over, and one inquiry for 15,000 tons for delivery in 1907 has been up. There is also further inquiry for shipment over the fourth quarter of this year, the tonnage involved being 25,000 to 40,000. In Forge Iron considerable inquiry is reported, but as yet there is little buying. The deliveries wanted are for the balance of the year. Some few buyers of Foundry Iron are asking figures on Iron for 1907. We revise our quotations as follows: Northern No. 1, $19 to $19.50; No. 2, $18.50 to $18.75; No. 2 Plain, $17.75 to $18, tidewater. Southern Iron is selling at from $18.75 to $19.25 for No. 1, and from $18 to $18.25 for No. 2, freight from Birmingham to New York being $4.

Steel Rails.—Buying for 1906 delivery has slackened off, as the mills are unable to make desired deliveries. Occasionally buyers are taking seconds where these can be utilized. About 6000 tons in miscellaneous orders was placed in the past week for delivery this year. The Seaboard Air Line has bought 20,000 tons for 1907 delivery, and the Southern Railway 15,000 tons of Bessemer Rails. The requirements of the latter road, chiefly in Basic Open Hearth Rails, have been largely placed in Alabama.

Structural Material.—Midsummer business is light and fabricating companies are either figuring on or booking small jobs or waiting for the return from vacations of those who are responsible for the letting of the large contracts now pending. There is no diminuation in the number of projects that are overhanging the market, but a distinct lull in contracting appears. Meantime some of the local erecting companies, whose attention for a considerable time has been confined to their New York contracts, owing to labor troubles, are figuring to a larger extent on work coming up in outside cities. The Western Pacific Railroad bridge contract, which was the largest business in suspense, amounting to 5500 tons, has been let to the Pennsylvania Steel Company. The Indiana Steel Company has given the American Bridge Company two additional buildings for the Gary, Ind., plant, calling together for about 900 tons of Shapes. Little is heard from San Francisco of Steel building plans apart from the estimates for the rebuilding of the Palace Hotel. An expenditure of about $3,000,000 is now talked of. The tonnage in Steel will probably run up to 6000. It has been a matter of comment that in the unusual run of work the fabricating companies have had in the past year, and are still having, prices have not been as high as in 1902, though the supply of work has been greater. The increased capacity in fabricating lines has shown itself. It is possible also that some contracts taken at rather low prices have netted the erectors more than apeared on the face of the contract because of the premiums paid for early completion of the work. Thus far the new structural capacity added in the past six or eight months has not made a marked impression on the situation. In the Pittsburgh districts the difficulties some of the mills have in getting material out of the mill, owing to the lack of room for handling, have offset somewhat the increased tonnage. We quote as follows on mill shipments, tidewater deliveries: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. the extra is 0.10c., and on Angles over 6 in., 0.10c. Beams and Channels out of stock are sold at 2.40c. to 2.50c.

Bars.—The demand continues to improve, and some important interests are placing fair sized contracts. Among these may be noted the manufacturers of metal bedsteads, who have taken considerable quantities of Small Angles. Mill shipments, tidewater, are quoted at 1.64½c. for either Steel Bars or Best Refined Iron Bars.

Plates.—In Sheared Plates sales agents report a fair trade in small lots, but the mills are not receiving any orders from this vicinity for large quantities. A purchase of 200 tons would be considered quite a large order. The demand for Universal Plates is considerably better than for Sheared. Quotations for tidewater delivery are as follows:

Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—The demand keeps up most remarkably. Buyers, being unable to get anything earlier, are now placing orders for November and December delivery. This is an unusual proceeding, and indicates the straits to which consumers of Pipe are this season being reduced. The demand, although the heaviest ever known in the history of the Pipe trade of this country, is not attributed to any extraordinary cause, but simply to the prevailing general prosperity, which causes the extension of water and gas lines in connection with established plants and stimulates new enterprises of this character in localities which have hitherto been without such service. Every few days an inquiry is in the market covering several miles of Pipe. Carload lots of 6-in. are nominally quoted at $31 to $32, tidewater.

Old Material.—Cast Scrap, Stove Plate and Steel Scrap are in particularly good demand. Among the sales of the week was 1,000 tons of No. 1 Machinery Cast at $16.50, New York. Another sale of 1,000 tons was made, delivered at a nearby point, which brought an equal price on the New York basis. A sale of 500 tons of Stove Plate was made at $11.50 New York, and the buyer was subsequently desirous of increasing this to 1,000 tons, for which he was willing to pay the same price, but the offer was declined. Several thousand tons of Steel Scrap have been sold at an advanced price on the quotations of the previous week. Embargoes at Eastern Steel works have been lifted and deliveries are now being made more freely. Wrought Scrap is moving much more liberally, and prices are about 50c. per ton higher. Inquiries are now coming in on all classes of Old Material, and great activity appears to be promised for this fall. Quotations for New York and vicinity are approximately as follows:

Old Iron Rails	$20.50 to $21.00
Relaying Rails	26.00 to 26.50
Old Steel Rails, rerolling lengths	16.50 to 17.00
Old Steel Rails, short pieces	15.50 to 16.00
Heavy Melting Steel Scrap	15.50 to 16.00
Standard Hammered Iron Car Axles	26.00 to 26.50
Old Steel Car Axles	20.00 to 20.50
No. 1 Railroad Wrought	18.50 to 19.00
Iron Track Scrap	16.50 to 17.00
No. 1 Yard Wrought, long	17.00 to 17.50
No. 1 Yard Wrought, short	16.00 to 16.50
Wrought Pipe	13.00 to 13.50
Light Iron	9.50 to 10.00
Cast Borings	9.00 to 10.00
Wrought Turnings	11.25 to 11.75
Old Car Wheels	17.00 to 17.50
No. 1 Machinery Cast	16.00 to 16.50
Stove Plate	11.50 to 12.00
Grate Bars	10.50 to 11.00
Malleable Cast	16.00 to 16.50

Metal Market.

NEW YORK, August 8, 1906.

Pig Tin.—The week has been a very interesting one, with prices fluctuating extensively and finally closing to-day somewhat higher than those quoted a week ago. The wide speculation of the week originated in London, and prices advanced and declined sympathetically in the market. The only transaction of importance taking place here during the week was a sale of about 200 tons to the leading American consumer. This immediately started an advance to 38¾c., which was eagerly taken advantage of in London, where it is said the bears rushed to cover and the market was advanced until Friday both there and here, when the closing price was 39¾c. Monday being a bank holiday in London, the absence of cable quotations caused considerable caution among sellers here. There was scarcely any business done and the metal was quoted at 41c. at the close. On Tuesday morning the London cables opened £3 higher. It seems that consumers here are realizing the fact that spot metal is somewhat scarce, and as afloats are also small are accepting the present high prices. Yesterday prices here were at a premium of about ¼c. above the parity of London quotations, this being the first time that this has occurred in some weeks. The fluctuations of the week in London show an advance of £12 above the closing figures of a week ago, and the reaction since has amounted to about £4. The London market this morning opened £12 10s. off, and another decline of £1 was scored when the closing cable was received this afternoon. The closing quotations were £178 15s. for spot and £179 2s. 6d. for futures. In this market spot closed at 39c. to 39.50c., while August and September delivery are quoted 38.50c. to 39c. There is a feeling in some parts of the trade that prices in London are apt to advance further as the purchasers of three months' futures find it necessary to cover their transactions of last May. The three months are now about up. In other quarters of the trade it is believed that in view of the large declines made by the metal within the last month or two the short interests have had plenty of opportunity to cover, and have doubtless done so before this. Arrivals so far this month aggregate 296 tons, while it is estimated that about 2218 tons are afloat.

Copper.—Prices show a slight advance on last week's quotations, but general conditions are unchanged. The quotations of the New York Metal Exchange, which are given on a net cash basis, are as follows: Lake, 18⅝c. to 18¾c.; Electrolytic, 18⅜c., and Casting, 18c. to 18¼c. The leading producers quote 18¾c. for Lake, 18½c. for Electrolytic and 18¼c. for Casting. These quotations are, however, based upon 30 days' terms, and include delivery. The London market to-day closed as follows: Spot, £83 7s. 6d.; three months' futures, £82 17s. 6d., and Best Selected, £87 10s. The exports for the month amount to 3503 tons.

Lead.—In this market the metal is dull and easy, owing to the heavy importations from Europe. The present quotation is 5.75c., at which price Lead can be profitably imported from Europe, despite the duty of 2⅛c. During the month of July 2100 tons of European Lead arrived here, and since the first of this month 600 tons additional have arrived. The American Smelting & Refining Company is still quoting on the basis of price prevailing on day of shipment, and is not promising delivery prior to 30 days from date of order. Shipments of European Lead are obtained within two weeks of receipt of order. St. Louis quotes 5.65c., and the closing London cable to-day named £16 13s. 9d.

Spelter.—There is no change of importance to be noted. This market is dull at 6c. to 6.10c., and St. Louis remains unchanged at 5.90c. London cables £26 15s.

Antimony.—The market is very weak and prices are now entirely nominal. Cookson's is quoted 23c. to 24c., Hallett's is held at 23c., and other grades can be had at figures ranging from 21c. to 22c., according to brand. For shipment, the article can be had at from 1c. to 2c. less than the quoted figures. It is reported that the Russian Government bought about 160 tons through public tender about a week ago at about 18½c., delivered at St. Petersburg.

Aluminum.—No. 1 Ingots are held at 36c., and No. 2 Ingots at 34c. per lb.

Quicksilver.—Flasks of 75 lbs. in lots of 100 flasks, are quoted at $41 per flask. Small lots can be had at $41.50 to $42.

Nickel.—Large consumers are quoting 45c. to 50c. Nickel in small quantities can be obtained at 55c. to 65c.

Tin Plate.—Trade is good for the season. The mills are delivering Bright Plates about 14 weeks after specifications are received, and Terne Plates in eight weeks. The price is unchanged at $3.94, f.o.b. New York, and $3.75, f.o.b. Pittsburgh, subject to the usual trade discount. The Swansea market advanced 1½d. to 12s. 9d.

Old Metals.—There is little or no change in the market, and dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	17.75 to 17.87½
Copper, Heavy and Wire	17.50 to 17.75
Copper, Light and Bottoms	15.75 to 16.00
Brass, Heavy	12.00 to 12.25
Brass, Light	9.75 to 10.00
Heavy Machine Composition	15.75 to 16.00
Clean Brass Turnings	11.00 to 11.25
Composition Turnings	13.50 to 13.75
Aluminum Scrap	26.00 to 28.00
Lead, Heavy	5.20 to 5.35
Tea Lead	5.00 to 5.20
Zinc Scrap	4.40 to 4.60

Iron and Industrial Stocks.

NEW YORK, August 8, 1906.

Interest in the stock market greatly increased during the past week. Industrial stocks participated in the improved transactions. The market was greatly strengthened by the dividend declaration on the common stock of the United States Steel Corporation, and this influence continued for several days. Saturday, however, realizing sales ran prices down somewhat, the lowest level for the past week having then been reached. A sharp recovery set in on Monday, and in most cases the loss was fully recovered, while in others a still higher level was reached. The range of prices from Thursday of last week to Tuesday of the present week, inclusive, was as follows on active stocks: United States Steel common 39⅛ to 41½, preferred 106½ to 108½; Car & Foundry common 37¾ to 39⅝; Locomotive common 68¾ to 71; Colorado Fuel 51¼ to 56½; Pressed Steel common 51 to 53⅞; Railway Spring common 52¼ to 54; Republic common 28¾ to 30¼, preferred 98½ to 100; Sloss-Sheffield common 76 to 80; Cast Iron Pipe common 48 to 49. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can common 8, preferred 59½; Car & Foundry common 38½, preferred 100⅞; Locomotive common 58¾, preferred 113⅞; Steel Foundries common 11⅝, preferred 46; Colorado Fuel 53¾; Pressed Steel common 53, preferred 98¼, ex-dividend; Railway Spring common 53¼; Republic common 29, preferred 99; Sloss-Sheffield common 76½; Tennessee Coal 156¼; United States Cast Iron Pipe common 48, preferred 93¼; United States Steel common 40⅝, preferred 106⅛, ex-dividend.

Dividends.—The Niles-Bement-Pond Company has declared the regular quarterly dividend of 1½ per cent. on the

preferred stock, payable August 15, and a semiannual dividend of 3 per cent. on the common stock, payable one-half September 20 and one-half December 20.

The Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15.

The American Radiator Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable August 15, and 1 per cent. on the common stock, payable September 29.

Amended Marine Boiler Regulations.

WASHINGTON, D. C., August 4, 1906.—The Secretary of Commerce and Labor is about to promulgate an important series of amendments to the rules and regulations governing the construction and inspection of marine boilers, adopted by the Executive Committee of the Board of Supervising Inspectors of the steamboat inspection service, which has just concluded a special session in this city. Under the statute recently enacted by Congress these amendments, having received the approval of the Secretary of Commerce and Labor, now have the force of law and must be observed by all builders of marine boilers.

Main Steam Pipes.

The first amendment of importance made by the committee is a modification of section 13, rule 2, under the heading "main steam pipe." The formula providing for determining the thickness of and steam pressure allowable on all main steam pipes was originally intended to apply only to wrought iron or steel pipe, but inasmuch as no reference was made in this connection to copper pipe many builders have applied the formula to all pipe, whether of iron, steel or copper. The regulations as amended provide the following formula for pipe of wrought iron or steel:

$$T = \frac{P \times D}{10{,}000} + 0.125$$

$$P = \frac{(T - 0.125) \times 10{,}000}{D}$$

Where P = pressure of steam allowable in pounds.
T = thickness of pipe.
D = diameter of pipe.

Copper pipe is separately provided for under section 19, as follows:

All copper pipe subject to pressure shall be flanged over or outward to a depth of not less than twice the thickness of the material in the pipe, and such flanging shall be made to a radius not to exceed the thickness of the pipe. On boilers whose construction was commenced after June 30, 1905, no bend will be allowed in copper pipe of which the radius is less than one and one-half times the diameter of the pipe, and such pipe must be so led and flanges so placed that they may be readily taken down if required. Such pipes must be protected by iron casings when run through coal bunkers, and must be clear of the coal chutes. The thickness of material, according to the working pressure, shall be determined by the following formula:

$$T = \frac{P \times D}{C} + c$$

Where T = thickness in inches.
P = working pressure.
D = inside diameter of pipe in inches.
C = 8,000, a constant.
c = 0.0625.

Furnaces.

Section 16, rule 2, has been amended by striking out the formula for determining the steam pressure allowed on cylindrical flues used in furnaces of the Adamson type and substituting the following, which includes plain circular furnaces or flues, as well as Adamson furnaces:

When plain horizontal flues are made in sections of not more than 4 ft. 6 in., and not less than 23 in. in length, and not less than 5-16 in., and flanged to a depth of not less than three times the diameter of rivet hole plus the radius at furnace wall (inside diameter of furnace), the thickness of the flanges to be as near the thickness of the body of the plate as practicable.

The radii of the flanges on the fire side should be not less than three times the thickness of plate.

The distance from the edge of the rivet hole to the edge of the flange shall be not less than the diameter of the rivet hole, and the diameter of the rivets before driven shall be at least ¼ in. larger than the thickness of the plate.

The depth of the ring between the flanges shall be not less than three times the diameter of the rivet hole, and the ring shall be substantially riveted to the flanges. The fire edge of the ring shall terminate at or about the point of tangency to the curve of the flange, and the thickness of the ring shall be not less than ½ in.

Plain circular furnaces of flues and Adamson furnaces made in sections not less than 23 in. in length.

The pressure allowed shall be determined by the following formula:

$$P = \frac{51.5}{D}\left\{18.75\,T - (L \times 1.03)\right\}$$

Where P = working pressure in pounds per square inch.
D = outside diameter of furnace in inches.
L = length of furnace in inches.
T = thickness of plate in sixteenths of an inch.

Cast Steel and Cast Iron.

Section 20, rule 2, which prescribes requirements as to the use of cast iron or cast steel in boilers or pipes connected thereto, has been changed in important particulars to read as follows:

20. No cast iron subject to pressure shall be allowed to be used in boilers or the pipes connected thereto, except as described as follows:

Cast iron may be used in the construction of manhole and handhole plates, valves and cocks, water columns, flanges, saddles, ells, tees, crosses or manifolds when such flanges, saddles, ells, tees, crosses, valves and cocks or manifolds are bolted or riveted directly to the boiler and the valves or cocks; also castings of slip joints in pipes: Provided, however, that the material shall be of the best grade and of suitable thickness and uniform section for the pressure allowed on boilers.

Flowed steel castings shall possess a tensile strength of not less than 62,000 lbs., an elastic limit of not less than 30,000 lbs. to the square inch, reduction of area of not less than 35 per cent., elongation of not less than 25 per cent., and contain not more than 0.04 per cent. of phosphorus and not more than 0.03 per cent. of sulphur. Each of such castings shall be distinctly marked with name of manufacturer. Manufacturer shall furnish report of tests to supervising inspector of district where castings are to be used. All steel castings shall be thoroughly annealed. Castings of steel possessing the foregoing characteristics may be used for the necks or nozzles connecting the steam drum, or dome, and the boiler, and for the fittings of boilers and fittings of steam, feed and water pipes: Provided, that nozzles made of cast steel shall not be used in connecting shells of externally fired boilers to mud drums, when said nozzles are exposed to the direct action of the flame.

The amendments above noted take effect immediately.

W. L. C.

The Link-Belt Company.

As already announced in the columns of *The Iron Age* the Link-Belt Engineering Company of Philadelphia, and the Ewart Mfg. Company of Indianapolis, have been purchased by the Link-Belt Machinery Company of Chicago. The last named will operate both of the newly acquired plants and its own in their present locations. The Chicago firm has been in existence since 1880, maintaining a New York office from 1882 to 1888. The subsequent demands of the business pointed out the necessity of an Eastern manufacturing plant, and in the last named year the Link-Belt Engineering Company was organized at Philadelphia and has since been the Eastern headquarters. The Indianapolis plant will be used exclusively for the manufacture of the various chains, including the Ewart detachable link-belt.

The new management is centered in the following officials: James M. Dodge, Philadelphia, chairman of the board; Charles Piez, Philadelphia, president; Glen G. Howe, Indianapolis, first vice-president; Staunton B. Peck, Chicago, second vice-president; S. Howard-Smith, Philadelphia, treasurer; P. G. Reid, Philadelphia, assistant treasurer; Dyke Williams, Chicago, secretary; Edw. H. Burr, Philadelphia, assistant secretary.

The improved Sturtevant steam trap, although especially designed to use with the heaters built by the B. F. Sturtevant Company, Boston, Mass., is equally well fitted for operation with steam heaters or radiators of any construction. The body of the trap contains a pot, which floats and closes the connection between the interior and exterior until sufficient water accumulates in this space to overflow into the pot and sink it. Free passage for the water is thus afforded from the pot up to the outer air, which continues until the levity of the pot becomes sufficient to cause it to rise and close the outlet. The periodic delivery continues as long as there is water to discharge or sufficient steam pressure to cause the trap to act.

The article in last week's issue of *The Iron Age* describing the plant of the Youngstown Sheet & Tube Company failed to give credit to S. V. Huber & Co., Pittsburgh, for the engineering of the puddle mill, sheet mill, 20-inch skelp mill and pipe works comprising the entire plant as originally built.

Recent Customs Decisions.

The Steel Strip Case.

The Government has formally directed an appeal to the United States Circuit Court in the steel strip controversy. The Board of Appraisers promulgated a decision July 23 sustaining the claims of Hermann Boker & Co. and others of New York to the effect that the merchandise is not subject to an additional duty of 1 cent per lb., as contended by the Treasury Department. The Government was recently defeated on the same question in the Circuit Court of Appeals. Notwithstanding a succession of defeats before the board and the Federal courts in the former litigation, the Secretary of the Treasury intends to carry the latest strip case up to the Supreme Court if the Circuit Court and appellate tribunal affirm their earlier decisions in favor of the importers.

Steel Grinding Plates.

Another issue ordered appealed from the decision of the Board of Appraisers relates to the classification of steel grinding plates. When the case came before the board Thomas Prosser & Son of New York, claimed the merchandise to be dutiable at the specific rates in the tariff for "castings, plates, or steel, in all forms and shapes, according to the value per pound." This contention the tribunal sustained as against the plea of the Government for a 45 per cent. duty. The Treasury Department deems the issue an important one, and it is expected that the case will have a run through all of the courts.

Wire of Iron and Nickel.

Hermann Boker & Co., New York, suffered a customs defeat August 1, when the Board of Appraisers failed to sustain the firm's contention regarding the classification of wire composed of iron and nickel. Duty was assessed at the rate of 45 per cent. as a wire not specially provided for. Objection was made to this return, the importers insisting that the merchandise is properly dutiable as an iron or steel wire coated with nickel at the rate provided for the wire from which it is made with 2-10 cent per lb. additional under paragraph 137. In overruling the protest the board denies that the wire is "coated." On this point the decision says in part: "The evidence shows that the wire is produced by forcing an iron or steel wire core into a nickel tube or shell, and then drawing down the article to the required diameter. Wire thus produced cannot be said to be a wire coated with nickel; it is rather an iron filled nickel wire."

Tin Plate Prices.

The Syracuse Smelting Works, New York, failed in the attempt to reverse the assessment of duty made by the Collector at New York on importations consisting of mixtures of disks, strips and other articles of tin plate, claimed by the firm to be entitled to entry as scrap tin at the rate of 10 per cent. The case came before the Board of Appraisers on appeal last week. After considering the testimony adduced, the board finds that the customs officers correctly returned the merchandise under the provision in the law for tin plates with duty at the rate of 1½ cents per lb.

Iron Tubing with Flanges Attached.

The Board of Appraisers has promulgated a decision relating to the classification to be imposed on iron tubing with cast iron flanges attached. It seems that Charles Clarke & Co., Galveston, Texas, imported merchandise of this character on which the authorities assessed duty on the basis of 45 per cent. on the flanges and 35 per cent. on the tubing. The protest claimed that the articles should have been assessed on the tubing and flanges as entireties at the rate of 35 per cent. under the provisions of paragraph 135. This contention the board holds is well taken, and the protest is sustained.

Automobile Parts.

Importers of automobile parts are reported as having considerable friction with the customs officials, particularly at New York, regarding the invoice prices of the merchandise. Two of the largest concerns to experience differences with the representatives of the Treasury Department are said to be the American Locomotive Company and the Westinghouse Company. Thus far no official details of the trouble have been made public, but it is rumored that these companies have been obliged to pay duties on much higher valuations than those at which the goods were invoiced on the other side.

It is probable that the Board of United States General Appraisers will be called upon to arbitrate between the Collector of Customs and the importers. The action of the officers in raising the values comes as a surprise to the importing firms, which had not calculated on such a contingency.

A Scrap Decision.

The Board of Appraisers has decided that old rudders, fit only for scrap, are not dutiable as manufactures of metal at 45 per cent., but as scrap iron or steel at $4 per ton.

The Eight-Hour Law Officially Construed.

WASHINGTON, D. C., August 7, 1906.—The Attorney-General has approved and promulgated an opinion by the Solicitor-General holding in effect that the eight-hour law of 1892 does not apply to work on naval vessels built in private shipyards nor to armor plate, guns and other naval equipment, nor to supplies for the army, such as clothing, &c., when manufactured for the Quartermaster's Department by private individuals, firms or corporations. In a draft of the opinion transmitted to the Secretary of the Navy the Attorney-General, after citing the law of 1892, says the question is whether the phrase "public works" of the United States comprehends vessels under construction for the navy by contract with builders at private establishments over which the Government has no executive control. The opinion of Attorney-General Miller is then cited to the effect that the act of 1892 did not apply to the case of a contract for furnishing materials to the Government for use in the construction and equipment of public buildings. Continuing, the Attorney-General says :

> Attorney-General Griggs, construing the act of August 13, 1894, for the protection of persons furnishing material and labor for construction of public works, held that the act did not refer to contracts for the construction of naval vessels. Undoubtedly the phrase "public works" is of rather wide signification, and it has not been fully defined. Attorneys-General Miller and Griggs applied it to public buildings, and Attorney-General Griggs to river and harbor improvements. Without, however, attempting authoritatively to delimit this subject and say what things are embraced in the term "public works," I am very certain that vessels under construction for the navy are not, either in the common acceptance or within legal intendments.
>
> The uniform construction of the Navy Department appears to have been that neither the act of 1892 or of 1894 applies to contracts for the construction of vessels for the navy. And, finally, it seems that various bills have been introduced in Congress since 1892 to extend the eight-hour limitation of the work of laborers and mechanics to the performance of all contracts entered into by the Government, but no such measure has been enacted into law. If that is the proper policy of the Government and ought to be a law it is for Congress, in the exercise of its judgment and discretion, so to provide.
>
> My conclusion, therefore, is that the act of August 1, 1892, limiting the hours of labor, does not apply to vessels under construction by contract with builders at private establishments. The case of materials for such vessels, armor, guns, &c., obtained under special contracts, rests upon the ruling of the Attorney-General before quoted, which is hereby expressly approved and affirmed.

In a draft of the opinion forwarded to the Secretary of War the Attorney-General holds that the supplies for the Quartermaster-General's Department for the army manufactured under contract with private concerns are not subject to the provisions of the eight-hour law.

While the Attorney-General has thus decided that the law of 1892 does not apply to contracts for the manufacture of articles which are legally known as chattels, the courts of the District of Columbia to-day decided that the act does apply to the construction of bridges and similar "public works," and levied nominal fines upon officials of the Penn Bridge Company and District Construction Company for violation of the statutes. The officials referred to, upon the advice of counsel, entered pleas of guilty and were fined $25 each. The low fines were imposed at the suggestion of the United States Attorney for the District of Columbia, who informed the court that the prosecutions were brought primarily to test the validity of the law and to acquaint contractors on public works with the fact that hereafter the act of 1892 will be rigidly enforced. W. L. C.

The Insurance Question Foremost in San Francisco.

SAN FRANCISCO, July 28, 1906.—The insurance companies, what they will do and how much they will pay, are the principal subjects of interest in this city at present. While it is not positively known how much they will pay, it is certain that $120,000,000 out of $200,000,000 total estimated insurance is all that can be had, and it is not at all probable that it will be more than $100,000,000, or 50 per cent. of the face of the policies. The foreign companies are making a very poor record for themselves, some of them having practically refused to pay anything, and there is little doubt that others that have been playing for time will give the same answer, namely, "The fire in San Francisco was caused by the earthquake and we are not insuring against earthquakes or anything connected with them." Of course, the insured will fight this, but the companies are beyond the reach of the long arm of the United States. It is expected that after the adjusters of the companies that profess to pay dollar for dollar are through with the policyholders, the face of the policies will be cut down materially. The companies, 35 of them, that have agreed to pay dollar for dollar, have adjusted the claims of 120 policyholders. These include those of the following in the iron, hardware and metal trades: Charles Brown & Son, Pacific Stamping & Metal Works, Taylor & Spotswood Company, Compressed Air & Machinery Company, Dunham, Carrigan & Hayden Company, Union Iron Works, Palace Hardware Company, Pacific Gear & Tool Works and the Pacific Metal Works.

The establishment of temporary business places is proceeding rapidly. One of the notable sights is the number of retail hardware stores that are scattered over the burned section in all sorts of buildings, generally very small. On Van Ness avenue and Fillmore street there are, however, several very large ones. Nails are the articles principally in demand, an immense amount of them being used. Next come hinges, locks, &c. A good deal of corrugated iron is also being used. But an unlimited quantity of wire is demanded for electric wiring, dynamos, &c., and such material is very scarce, keeping the work back by the scarcity. A large number of new firms devoted to electrical work have started in operation.

There has been a general upward advance in wages here, with a shortening of hours. But this has not been brought about without some friction. The strike of the sailors, which has now been on for some time, has interfered considerably with trade, but all the steamers are running regularly again and business on the Coast has gone back to its accustomed channels.

The fall trade has opened up well both in city and country. While the demand for merchandise in general is expected to be much larger than that in the fall of 1905, there is no doubt that the sales of hardware, cement and structural steel in this State will be beyond all precedent.

The arrival of goods by rail has been very large and very steady. Upward of 600 cars of goods a day have been coming to hand, more than its usual share going to the hardware and metal trade. While merchants have been taking away their goods as fast as has been possible for them to do, still there is a great congestion of freight, and at present writing there are 6000 cars which it has been found impossible to move. Railroads have been threatening to advance the charges for the detention of cars from $1 to $10, and some method will have to be found for releasing the cars. T. O. L.

Publication has recently been made in a number of local papers to the effect that the Benson Mines, St. Lawrence County, New York, will be reopened and operated on a large scale by a company which has been organized for the purpose. We are advised that no company has been organized, nor have any definite steps been taken to operate these well-known deposits of magnetic ore. Some interest has been taken, however, in the proposition to resume the mining and concentrating of the Benson ores. It is stated that a high grade concentrate can be produced at the rate of 2000 to 3000 tons a day. It is believed that something will be done toward the operation of the property in the near future.

New Publications.

Wiring Handbook, with Complete Labor Saving Tables and Digest of Underwriters' Rules. By Cecil P. Poole. Size, 4½ x 8 in.; pages, 85, with 32 appended tables. Flexible leather binding. Price, $1. Publisher, the McGraw Publishing Company, New York.

In the author's words this book is intended for the use of wiremen who have occasion to lay out their own work, and engineers who make up wiring plans and specifications. This explains why the book contains rudimentary instructions and advice which the engineer will not need and formulas that the practical wireman may not understand and will not ordinarily require. The greatest usefulness of the book will be found in the tables printed in the back on separate folded sheets, which may be spread out for convenient use. Once these are understood by reading the explanatory text pertaining to them the user has occasion to refer to them only. The tables deal with such considerations as the allowable number of lamps on a circuit; relation between drop, wire size and load distance; capacities of standard sizes of wire; current required by motors, wire sizes for motors; power factors and inductance factors, resistance and reactance of copper wires; values of quantities in alternating current formulas; impedance drop for single, two and three phase motor circuits; busbar constants, and areas and perimeters of rectangular cross sections.

As with handbooks generally, it is not necessary for the individual to read from cover to cover. A reference here and there will supply the information needed. For example, at the beginning of the book is given a little on first principles in the part dealing with wiring terms and the measurement of feeders and mains. The other chapters as a whole are somewhat more elementary than the average person will require. A particularly useful part of the book is that containing a digest of the underwriters' rules applying to inside wiring.

Electric Power Transmission.—A Practical Treatise for Practical Men. By Louis Bell, Ph.D. Fourth edition, revised and enlarged. Publisher, the McGraw Publishing Company, New York City. Size, 6 x 9 in.; pages, 700; illustrations, 350; price, $4.

In the review of this book which appeared in the last issue the author's name was unintentionally omitted. Bell's "Electric Power Transmission" is so well known as a standard authority, from the three previous editions that have been published, that it seems almost unnecessary to supply the correction, except as a matter of principle.

Moody's Manual of Railroads and Corporation Securities for 1906.—Seventh Year. Pages, over 2800. Publisher, the Moody Corporation, 35 Nassau street, New York City. Price, $10 bound in cloth, or $12 in leather.

This book is the most comprehensive of the various manuals which are available for the use of those who desire to keep posted on values of securities of various kinds. It covers corporations in the following fields: Steam railroads, traction, gas and electric light, water supply, telephone, telegraph and cable, industrial, mining, banks, trust companies, &c. All the steam railroads of the United States, Canada and Mexico are reported on, with colored maps of many of the large systems. The electric traction section embraces statements of practically all the street railroad and traction companies in the United States and Canada. The industrial corporations have been the special field of this book from its first issue. This is a line in which the necessity for information is steadily becoming greater. The scope of the book is shown by the fact that the section devoted to gas and electric lighting companies has over 1000 entries. It further shows statements of upward of 8000 banks, trust companies and financial institutions.

Trade Publications.

Gas Meters.—Rotary Meter Company, 280 Broadway, New York City. Catalogue. Size 8 x 10½ in.; pages 31. This is a very attractively compiled book containing descriptions, with exterior and sectional views of rotary meters for the measurement of all artificial and natural gases, whether under low or high pressures, for the measurement of air in oxide revivification compressing machinery, regenerative furnaces, producer gas, blast furnace gases, &c. A good deal of historical and instructive interest is included on the subject of meters in general. The rotary meter is an English invention, originally thought out by Thomas Thorp and developed by him in conjunction with Thomas G. Marsh. Among the principal claims for the meter are that it is direct reading, needing no corrections, that it measures the whole of the gas and not simply a part of it, as in a proportional meter, that its construction is simple and its applicability wide, and that it occupies a very small space. It is intended principally as a station meter. The catalogue also describes an individual meter of rotary type, and Thorp's antipulsator, which, used in connection with a meter, enables the measurement of gas in connection with gas engine installations.

Engineering Work.—Dodge & Day, Drexel Building, Philadelphia, Pa. Pamphlet No. 15. One of a series on representative industrial power plants. Contains illustrations and brief references to work undertaken for the Link Belt Engineering Company, Jeanesville Iron Works Company, William Knabe & Co., Victor Talking Machine Company and others.

Conveying Machinery.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1707. Has reference especially to machinery for use in sawmills.

Coal Conveyors.—Robins Conveying Belt Company, Park Row Building, New York City. Bulletin No. 15. Has for its subject "Robins Conveying and Elevating Machinery in Retail Coal Pockets and Locomotive Coaling Stations." While a general discussion of coal handling methods illustrated with numerous typical installations of machinery or details of its parts is given, the main object of the catalogue is to induce the individual to submit details of his own particular problem, that the company may recommend an equipment best adapted to the particular need. This fact is called attention to in a leaf inserted in the bulletin.

Steam Specialties.—Howe Mfg. Company, Louisville, Ky. Catalogue. Size, 4¾ x 7⅞ in.; pages, 75. This is a general catalogue covering a wide range of products, and has of necessity been condensed, presenting matter mostly by illustrations rather than text. Among the valves shown are globe, angle, check, cross, gate and radiator valves. An oddity is a radiator valve arranged to be operated with the foot. Other articles listed in the catalogue include gauges, thermometers, water gauges, expansion tanks, fittings, hot water heaters, &c.

Milling Machines.—Owen Machine Tool Company, Springfield, Ohio. Catalogue B. Size, 6 x 9 in.; pages, 55. Since the publication of the company's last catalogue it has brought out five new sizes of positive feed milling machines, all provided with a recently patented speed box device. These are known as Nos. 2B and 3B plain and Nos. 1½A, 2A and 3A universal. Among the other milling machines shown and which have been made by the company for a longer time are duplex milling machines, hand milling machines, power feed and hand milling machines and a line of plain milling machines. The latter part of the catalogue deals with rack cutting, circular and vertical spindle milling attachments, and various tools, tool vises, chucks, indexing heads, &c.

Self-Contained Geared Hoists.—Wellman-Seaver-Morgan Company, Cleveland, Ohio. Circular No. H-O 8. Refers to the standard self-contained geared hoisting engines made at the company's Webster, Camp & Lane division, Akron, Ohio. The hoists are built in a variety of sizes, with single or double drums, mounted on a substantial cast base. The illustrations show different varieties of these hoists, with specifications of the dimensions, capacities, &c.

Blowers, Fans and Engines.—American Blower Company, Detroit, Mich. Catalogues and circulars. Catalogue No. 189, 7 x 8¾ in. in size, containing 82 pages, covers steel plate fans for heating, ventilating and drying plants, forced and induced draft apparatus, &c., showing the numerous forms of housings with which they are furnished. Catalogue No. 190, of the same size and 48 pages, deals with blowers of the forms intended particularly for cupolas, forges, melting and heating furnaces, forced drafts, pneumatic tube systems and all other appliances where a strong, steady air pressure is required. Miniature catalogue No. 192 concerns the "A B C" dryers; No. 193 gives the constructional details of the "A B C" double, inclosed high-speed self-oiling engines, type E. Catalogue No. 194, supplementing Nos. 171 and 193, deals with engines for small direct connected sets, these being the types A and E. Circular 195 describes an exhaust hood for buffing and grinding wheels. Circular 196 also deals with the types A and E self-oiling engines. Catalogue No. 200, of the standard sectional catalogue size, is devoted to disk ventilating fans, and contains 44 pages. Circular No. 201 gives a description of the lubricating system in the type A self-oiling engines. Circulars Nos. 202 and 203 deal, respectively, with electric driven and belt driven disk ventilating fans.

Electric Transformers.—Crocker-Wheeler Company, Ampere, N. J. Bulletin No. 65. Describes the new features of the Crocker-Wheeler core type transformers.

Electric Lathes.—Emerson Electric Mfg. Company, St. Louis, Mo. Bulletin No. 3703. Describes laboratory lathes for direct current, listing two types adapted, respectively, for 110 and 220 volts.

Concentrating Mills and Machinery.—Traylor Engineering Company, New York City. Catalogue H. Size, 7 x 9½ in.; pages 64. Confined to the products of this company which come under the foregoing heading, although, as stated in the introduction, it does not describe all of the company's products for this class of work. Among the products shown are automatic scales, rock and ore crushers, belt and bucket elevators and conveyors, cars, concentrators, screens, centrifugal sand pumps, Chilian mills, stamp mills, screens and other auxiliary apparatus.

Furnaces and Smelting Accessories.—Traylor Engineering Company, New York City. Bulletin No. 50. Deals with the products of this company, designed for use in smelting, including copper matting furnaces, silver lead furnaces, forehearths, lead coolers, hot blast stoves, slag trucks, copper converters, cupelling furnaces and positive pressure blowers.

Power Hoisting and Mining Machinery.—Traylor Engineering Company, New York City. Catalogue F. Size, 7 x 9 in.; pages 72. The contents of this catalogue are systematically grouped, beginning with double drum geared hoisting engines, self-contained hoists with double drums and single drums, and other varieties of hoists for steam and animal power; continuing, it treats of cages, water buckets, skips and ore cars. The next section of the catalogue deals with engines, including vertical and horizontal engines for small powers and Corliss type engines for heavy duty. The remainder of the catalogue deals with plant apparatus, such as feed water heaters and boilers, with the exception of the last part, which touches on water power, showing Pelton water motors and some of the products listed in other catalogues.

Turret Boring, Drilling and Tapping Machines.—A. D. Quint, Hartford, Conn. 1906 catalogue. Size, 6 x 9 in.; pages 24. Covers the machines which are a specialty of this builder, including vertical turret, drilling, tapping and chucking machines. The line shown differs from that presented in previous catalogues by the omission of the No. 1 friction drill, the manufacture of which has been discontinued, and the addition of a No. 2 improved drill made with from 6 to 12 spindles. The back gears are reversible for tapping, all taps being fastened direct to the spindles, doing away with all tap-holder attachments. Circular No. 12 describes and gives specifications of Quint's 32-in. 6-spindle turret machine for boring, drilling and tapping, and also a vertical turret chucking machine and turret drill. Another circular deals solely with the improved No. 2 turret drill.

Traveling Grates.—Green Engineering Company, Western Union Building, Chicago, Ill. Catalogue and two circulars. Catalogue E on alternate pages contains numerous illustrations of the Green traveling link grates, complete, and its details and intermediate pages contain a complete description. Several line drawings show typical manners of installing. Quite a little useful information is given in the back part of the catalogue on the subject of coal. Tables of properties of coal, classified by States, counties and seams are given, with explanations for using the tables. One of the circulars contains a list of users of the traveling link grate, and the other contains a number of testimonial letters. The principal claims for the grate are that it is automatic, smokeless and labor saving.

Drafting Machines.—Universal Drafting Machine Company, Cleveland, Ohio. Catalogue. Contains a description of the Universal drafting machine, a device dispensing with the use of squares, triangles, protractors and separate graduated scales in the making of mechanical drawings. Illustrations show several applications of the device to various classes of drafting. The great claim for the instrument is that it saves time without sacrificing accuracy. The machine is made in three standard sizes for drawings of 18 x 24, 30 x 36 and 32 x 42 in. maximum sizes, respectively. A cheaper machine, called a Rapid Sketching Machine, is also made, and is briefly described in another circular. A third circular gives an extensive list of users.

Lathes.—F. E. Reed Company, Worcester, Mass. Two circulars. One describes and illustrates a 16-in. motor driven engine lathe, and the other an 18-in. belt driven high speed engine lathe, designed for use with high speed cutting steel.

Metallurgical Furnaces.—Rockwell Engineering Company, 26 Cortlandt street, New York. Three circulars. One deals with the Rockwell double chamber metal melting furnace for copper, brass, bronze, aluminum, iron and steel, &c., using oil or gas fuel, no crucibles being required. The second refers to the Rockwell oil burners, adapted to either high or low pressure and the third to Rockwell brazing furnaces using oil or gas fuel.

The Machinery Trade.

NEW YORK, August 8, 1906.

Delay in closing their orders on the part of a number of railroads who have out important lists of requirements is the principal topic of comment in the trade this week. It is remarked that while there are an unprecedented number of inquiries out, taking into account the time of the year, there are not many orders being closed. Just why railroads that are really in need of machinery should put off buying at a time when deliveries are unsatisfactory, to say the least, is a matter that is giving the trade much food for speculation. A number of large corporations that have been buying steadily for some weeks for improvements they have under way placed orders last week, and the trade therefore did not suffer as regards the amount of business done; but there are so many propositions that have been up for a long time and are still hanging fire that there are some machinery men who are impatient to know just when those interested propose coming to the front with orders.

The week has been marked by desultory buying in the machine tool line, but not so much so that it would give any of those in the trade cause for complaining of bad business. In the power field the dealers have been quite busy and they continue to be able to give fairly good terms as regards deliveries. It is expected that almost any day two or three of the leading railroads will begin buying on the lists they sent out some weeks ago, and the American Smelting & Refining Company is expected to close very soon an extensive list of orders. The United States Steel Corporation has been doing some buying, but its movements in that respect during the mouth have been by no means as large as the transactions it made during May and June. Taken altogether, the month of July was a satisfactory one to the trade in general, and a number of large machine tool houses exceeded their records as regards July business.

German Exports Continue Heavy.

The increase made by the German Government some time ago in the duties on American machinery, and especially machine tools, has, from all accounts, affected the German machinery trade with this country but slightly. German houses which buy in this country for export to their home offices are so crowded with orders that they are unable to promise deliveries within several months, and while the fact that all classes of the machinery trade are rushed with work just now is partly responsible for that condition of affairs, it is said that orders from Germany have not fallen off to a noticeable extent since the new tariff rate went into effect. A representative of one of the prominent German firms declared last week that, if anything, the business of his company had increased as regards the amount of machinery it has purchased in this country for export to Germany and other European countries. He declared that the customers of his firm had been buying in this country only machinery that they really needed and could not obtain so cheaply or to such good advantage in their own country, and, consequently, the increase has done but little to help the German manufacturers, which it is supposed was the object of the advance going into effect. As a matter of fact most manufacturers here are so rushed with business that they are not looking for foreign trade so diligently as some of their European competitors, and even under such circumstances business in that line is all that it should be.

The announcement made in these columns a few weeks ago, to the effect that several important manufacturers of cranes had decided not to give out blue prints in making bids for works, has been borne out by the experience of a number of prospective purchasers along those lines who have recently asked the trade to submit proposals to them. In some cases bidders have refused even to loan photographs of their machinery, and the would be buyers have been obliged to content themselves with a description of the equipment furnished with the proposal. In most cases those who have asked for bids on cranes have been requested to furnish the trade with specifications of the equipment they need. The indications are that the manufacturers will stand firm in their decision to refuse to give blue prints, and they declare that the conditions as far as they are concerned are already improved, inasmuch as there are fewer demands that they furnish only parts of their cranes, as purchasers under the new rule of doing things are not able to build sections of the equipment from the blue prints furnished them.

Purchasing for Utah Smelter.

The American Smelting & Refining Company has come into the market during the past week for a large amount of equipment for the plant being constructed at Salt Lake City, Utah, by the Utah Copper Company, which is controlled by the former company. It was the original intention to make this a 3000-ton plant, but lately it has been decided, it is understood, to double it and erect a 6000-ton plant. The company is asking for early delivery on the equipment for which it is receiving bids, and according to all indications it intends to construct the smelter as rapidly as possible. When the original specifications were issued by the company the requirements included about 300 reciprocating concentrating tables, 300 vanners, 24 sets of 15 x 36 rolls, 36 6-ft. Chilian mills, about 4000 hp. of induction motors, ranging in size from 25 to 250 hp., steam and electric machinery for a 5000-hp. generating plant, an electrical pumping plant having a capacity of 5000 gal. a minute against a head of 250 ft., and a large number of elevators, conveying screens, transmission machinery and the like. It is expected that these requirements have been practically doubled since it has been decided to enlarge the plant, and in addition coarse ore crushing machinery, sufficient to handle about 6000 tons daily, will be required. It is expected that all of the orders will be placed in this city, as the inquiries have come from the company's New York office. It may be said that the American Smelting & Refining Company has a number of other large enterprises well under way and the trade can look for a strong buying movement from that source during the summer months. The company has begun work on its large smelting plant near San Francisco. A large amount of machinery has already been purchased for that plant, and it is said in the trade that there is more business to follow from that source.

The American Locomotive Company has decided to erect an addition to its Richmond plant for the manufacture of steam shovels, which has become an important branch of the company's business. Plans for the new building have been drawn and are now awaiting the consideration of the Board of Directors of the Richmond branch of the company's works. The new factory will be built directly opposite the present locomotive works, and it will be necessary to close one of the streets, which the company had opened previously as a business street, reserving the right to close it at will. It is understood that the plans include the erection of two large cranes, which will probably be used for outdoor service. It is remarked in the trade that no orders have been placed as yet for the addition, although the company has been buying some machinery of late for other plants.

Railroad Improvements.

The Delaware & Hudson Railroad, with New York offices at 52 Nassau street, is preparing to make an extensive addition to its yards at Binghamton, N. Y. The company has purchased a large tract of land there and it expects, in addition to increasing its yard facilities, to build a large roundhouse and a machine shop. The machine shop will not be an extensive one in size, but will be used for making minor repairs, and plans are now being prepared in the company's office at Albany, from where all the buying will be done. It is understood that the improvements will not be made immediately, and so far only the property has been purchased and preliminary plans made. At present the company has shops at Oneonta and crippled cars laid up in the vicinity of Binghamton have to be moved there. It has been found that the Oneonta shops are hardly capable of taking care of all of the company's work in that vicinity, and the decision to build shops at Binghamton is the result of that condition.

The Lackawanna Railroad has been buying some equipment for its new shops at Kingsland, N. J., and while there is no list out as yet the trade can look for considerable business from that source before long. The company has been making extensive additions to its Kingsland shops for the last year or so and by no means all of the equipment has been purchased. The recent purchases consisted of some odds and ends of equipment for the section of the new plant now in operation.

There have been some inquiries of late from the Erie Railroad for equipment which some people in the trade think is intended for the proposed Bergen shops, just outside of Jersey City. The Erie is expected to do considerable buying shortly for its marine shops at Hoboken. It is understood that all the plans have been prepared for these shops and they are to be put into commission as soon as possible.

The Brown-Lipe Gear Company, Syracuse, N. Y., has begun the erection of a five-story and basement factory building of reinforced concrete, in order to combine all of its manufacturing under one roof. The new structure will take the place of two buildings which the company now occupies. The company is adding about 20 pieces of machinery at present, and they consist of several Potter & Johnston automatic chucking machines, large sized Bullard turret lathes, 30-in. Bullard boring mills, multiple spindle drills and Gridley automatic screw machines.

The plant of the Foster Brothers Mfg. Company, Utica, N. Y., which was burned to the ground, is rapidly being rebuilt, and the stone foundation for the company's new foundry is already in place. The company expects to complete its foundry first and other buildings will follow. It is said that the roof of the main structure will be completed by December. The company manufactures spring and iron

beds, and it is now arranging for the necessary machinery equipment, which it is hoped will be delivered by spring. It is expected that the company's plant will be in full operation by April of next year.

The Singer Sewing Machine Company is making a large addition to its extensive plant at Elizabethport, N. J., and it has some inquiries in the market for machinery needs. It is understood that the company is already cramped for room and it is the intention to spread out some of the machines now in use. The company will also increase its manufacture at its Elizabethport plant to a material extent and in doing so it will need a good amount of machine tools, principally milling machines, it is understood. E. H. Bennett, who is at the company's Elizabethport plant, will have charge of the purchasing.

Bids will be opened on August 23 by the Commissioner of Street Cleaning of the City of New York, at his office in the Park Row Building, for the construction of a rubbish incinerating furnace on the pier at the foot of West Forty-seventh street, and on August 16, at the office of the Department of Docks and Ferries, at Pier A, foot of Battery place, bids will be opened for furnishing two heating boilers at Pier A, North River.

Chicago Machinery Market.

CHICAGO, ILL., August 7, 1906.

Following the advance on millers one manufacturer of turret screw machines has marked up quotations 5 per cent., and the indications are that other makers of this type will follow with higher prices. Advances in other lines are also anticipated, as the demand continues greatly in excess of the production notwithstanding the mid-summer season. The molders' strike, which has curtailed the output of machinery castings, is delaying tool builders, and great difficulty is being experienced in securing parts from centers not thus affected, as the union molders employed in these shops refuse to work on patterns from any of the foundries where strikes are on. Large builders of electrical machinery and tools in this city and Milwaukee operating their own foundries are sending their patterns to all parts of the country, and are meeting with but little success in securing castings. Other Western manufacturers are having similar experiences, and shipments of machinery are being constantly further deferred. There is no abatement in the current demand for both new and second-hand equipment and dealers' stocks are rapidly being reduced. Periods of abnormal prosperity in the machinery trade are usually characterized by the organization of new companies for the manufacture of staple lines or specialties with improvements on existing makes. The Steinle Turret Machine Company has been incorporated at Madison, Wis., for the manufacture of turret lathes, and plans have already been prepared for the erection of a large plant. None of the machinery or other equipment has yet been purchased, and a list comprising 18 tools of miscellaneous types has just been issued. This is the largest industrial offering that has been received by the trade in several months, although the International Harvester Company is again buying machinery for its Milwaukee gas engine plant, which has proved inadequate to the demands on its output. The Illinois Central Railroad Company is still negotiating, and has not closed for any of the equipment specified in its comprehensive list recently promulgated.

The Indianapolis, New Castle & Toledo Railroad, with headquarters at Indianapolis, has awarded contracts to the Allis-Chalmers Company, Milwaukee, for its complete power station, including buildings and all steam and electrical equipment, as follows: Two 1000-kw. a.c. turbo generators, six 350-kw. o.w.c. transformers, nine 150-kw. o.f.s.c. transformers, three 150-kw. o.f.w.c. transformers, four 400-kw. rotary converters, eight 75-hp. quad-railway motor car equipment, eight complete Christensen air brake equipments, switchboard equipment, boiler plant and three complete substations.

The Allis-Chalmers Company, Milwaukee, reports the following recent sales: Seven 2000-kw. gas engine generating units and two 2000-kw. d.c. units of the same type for the Indiana Steel Company, Gary, Ind.; one 32 x 42 in. Randem gas engine unit, direct connected to a 500-kw. generator, for the Bay View mills of the Illinois Steel Company; one 350-kw. gas engine generating unit for the Trenton Iron Company, Trenton, N. J.; one 32 in. and 68 x 60 in. Reynolds heavy duty cross compound condensing engine for the Cleveland Electric Railway Company, Cleveland; one 19 in. and 38 x 42 in. Reynolds combined horizontal and vertical engine with two fly wheels for the Ansonia Brass & Copper Company, Ansonia, Conn.; one 26 in. and 54 x 54 in. Reynolds heavy duty cross compound Corliss engine for the United Gas Improvement Company, Philadelphia; three 400-kw. "A1" rotary converters, and six 75 kw. o.f.s.c. transformers and one 50-kw. motor driven exciter and switchboard for the Woodward Iron Company, Woodward, Ala.

The Pacific Jupiter Steel Company, San Francisco, Cal., manufacturer of steel castings, is contemplating the installation of another open hearth furnace and the erection of a 200-ft. addition to its foundry. An electric traveling crane will also be installed as well as additional equipment for cleaning castings.

The Western Electric Company, Chicago, has had plans prepared by Architect T. E. Davidson for a one and two story black wire factory, to be erected in connection with the company's plant at Hawthorne. It will cover an area of 120 x 163 ft., and will be of fireproof construction. Considerable wire drawing and insulating machinery will be installed.

The Independent Pneumatic Tool Company, Chicago, Ill., has appointed Lake, Hale & Co., 11 Front street, San Francisco, Cal., its exclusive Pacific Coast representatives. A complete line of Thor piston air drills and reamers, reversible flue rolling, tapping and wood boring machines, pneumatic riveting, chipping, calking and beading hammers will be carried in stock by this company. During the past few weeks a large number of orders have been received from Pacific Coast States, and the prospects for greatly increased business in the line of pneumatic tools from this section are exceedingly promising.

Proposals will be received by H. C. Lange, Commissioner of Water Works, Galveston, Texas, on August 30, for furnishing four 200-hp. water tube boilers with all steam, feed water and smoke connections. The work will be let as one contract, and must be planned so that the city will not be deprived of the necessary use of the old plant during construction. Bids will also be received separately for the erection of one steel or brick stack 72 in. in diameter and 125 ft. high.

F. C. Irvine, Marquette Building, Chicago, is in the market for two 250-hp. water tube boilers and two Corliss engines of 400, and 600 hp. capacity each. A steel building will also be purchased, having dimensions approximately 165 x 300 ft.

The Ohio Elevator & Machine Company, successor to the Snyder-Taylor Elevator Company, Columbus, is in the market for one 10 x 48 in. automatic gear cutter.

The Mitchell & Lewis Company, Limited, Racine, Wis., wagon manufacturer, will erect a new factory building four stories high, 251 ft. long and 54 ft. wide, with an ell 60 x 165 ft. of the same hight as the main building. The addition of an extra story to one of the old buildings connecting with the new building is also being considered, which will make the total length of the buildings in this section of the plant 54 x 389 ft., with a uniform hight of four stories. The list of machinery requirements has not yet been promulgated, but it is the intention to use electric power exclusively, and approximately 125 hp. will be used. The buildings will be heated by exhaust steam, and will be provided with a sprinkler system for fire protection.

The Texas & Pacific Railroad, according to advices from Vice-President and General Manager L. S. Thorne, with headquarters at New Orleans, will erect new shops at some advantageous point on its Louisiana division. Shops are now located at Gouldsboro, La., and Marshall, Texas.

The Atlanta, Birmingham & Atlantic Railroad is building new shops at Fitzgerald, Ga., for which a large amount of machinery and equipment will be required, but the list has not been issued. The buildings include machine shops, 75 x 300, with electric traveling crane of 85 tons capacity; blacksmith and boiler shops, 75 x 300; engine house, 80 x 350; coach shop, 80 x 300; coach paint shop, 75 x 280; power house, 50 x 100; planing mill and wood shops, 75 x 150; pattern shop, 50 x 180; storehouse, 75 x 150, and foundry, 50 x 150.

The plant of the Fort Dodge Metallic Corrugated Culvert Company, Fort Dodge, Iowa, has been purchased by James Fitzpatrick and C. C. Carter, and a company will be organized with a capital of $25,000 to engage in the manufacture of steel culverts. The factory building is to be enlarged and new machinery, including drills, formers, corrugators and sheet metal working machinery will be installed. The power generating equipment has not been definitely decided upon.

Cincinnati Machinery Market.

CINCINNATI, Ohio, August 6, 1906.

Machine tool builders report no decline in business, deliveries being as much delayed as during the early months of the year. These vary with different shops but in the majority of cases are from three to five months behind. Some months since a specific advance was made all along the line with the possible exception of milling machines. Now this branch of the industry has come forward and advanced the price on machines of this character about 5 per cent.

About a year since a number of Cincinnati people incorporated a company known as the Shaw Crucible Steel Company, located at Hoquiam, in the State of Washington. The plan of the organizers was to take black sand from coast deposits, separate the ore from the sand by the use of electro magnets, and by a new process convert the ore into steel. The plant has been in process of erection since last October, and during the past two months a number of experiments have been made to produce steel by the open-hearth process. John A. Ringold, secretary of the company, states that the company has succeeded in doing this, and that it will at once proceed to put the plant on a commercial basis. It is claimed that the product is absolutely free from sulphur and phosphorus, and ingots can be made at a cost of $12.50 per ton.

Greaves, Klusman & Co., Cook and Alfred streets, will erect a one-story brick addition to their plant, 40 x 125 feet, to be utilized as the planer department. The capacity of the present plant will be increased about 25 per cent., which under present conditions is very desirable as the shop is crowded with work. Several new planers, a milling machine and a number of lathes will be added to the equipment as well as several smaller tools, all of which are contracted for.

The Lane & Bodley Company has secured a permit to erect an addition to its Bond Hill plant. This structure will be one story high, of steel and concrete construction.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 7, 1906.

A very satisfactory volume of business has been placed during the past week with the local manufacturers and machine tool merchants, more in fact than was generally expected would develop in the first week of August. Orders have been mainly for individual tools. Here and there a sale covering a number of tools is heard of, but large propositions are noticeably quiet. Some few additional orders have been received during the week from the Pennsylvania Railroad, while several of the other railroads have had small inquiries before the trade. The expected lists from the Southern railroads, however, have not yet made their appearance. There has been more buying of late from the various automobile repair shops, which are rapidly increasing in number, and while the individual sales have not been large and the tools, as a rule, are those of the smaller types, the business transacted has been of quite fair volume.

Inquiries for the general line of machine tools hold up exceedingly well, small and medium sizes being in better demand. It is also particularly noticeable that these smaller propositions close up more promptly and more satisfactorily than do the larges ones, the vacation period no doubt having considerable influence on this condition of the trade. Deliveries, however, are the most important feature of the business of to-day. There is scarcely any doubt that the volume of business placed would be largely increased could prompt shipment be made of tools desired. The inability to get such delivery causes considerable delay in placing the order, and when it is known that tools of certain sizes and classes cannot be had during the remainder of the year, or as in some few cases not until early in 1907, there is a strong inclination on the part of some customers to withhold the order to see what next year brings forth. In other cases a second-hand tool may be bought to tide over the immediate wants of the purchaser. The inability to get prompt deliveries of raw materials of various kinds which enter into the construction of nearly all classes of machinery and tools acts as a further drawback on deliveries of tools in many instances.

Foreign demand remains unchanged. A fair amount of new business in special tools has developed, but that for the general run of machine tools is inactive. Manufacturers transacting an established foreign trade in machinery specialties report about the usual midsummer volume of business.

The demand for boilers and engines does not improve very rapidly, although sales of engines of medium horsepowers are to be noted. There has also been a somewhat better sale of the smaller sizes of boilers, but the sales of those of the higher capacities have not been numerous. Inquiries are reported better, but the resulting business is slow in developing.

Second-hand machinery dealers report a good volume of business for the season. There is a good demand for tools of the better grades, but in some cases it is difficult to furnish promptly the tools desired, and in almost every case where second-hand tools are bought it is largely the matter of delivery that is the important factor of the sale.

The tonnage of both steel and gray iron castings being offered continues large and the ability on the part of the foundries to make good deliveries does not improve. Many of the steel casting plants have practically their full tonnage for the balance of the year contracted for and are unable to take on any business for early delivery. The gray iron foundries are also busy, but not as fully occupied as the steel casting plants.

The Board of City Surveyors for the City of Philadelphia have approved plans for the construction of five new bridges. They will be located at Gorgas and Phil-Ellena streets and Mt. Pleasant avenue, over the tracks of the Philadelphia & Reading Railroad, and on the line of Cresson street, over Midvale avenue, and on the line of Fifty-eighth street, over the tracks of the Pennsylvania Railroad. The railroad companies, over whose tracks the bridges will cross, are to pay one-half the cost of erection. Bids for the construction of these bridges are expected to be asked for at an early date.

H. B. Underwood & Co. have recently shipped a number of their line of portable tools for export to London, England, among which were three portable boring bars and a crank pin turning machine. A large lathe boring bar is still to be shipped to complete the order. The demand for portable shop repair tools continues very good. A number of orders for small tools for export have also been recently received. A large crank pin turning machine has been furnished the Wilmington shops of the Pennsylvania Railroad, while valve seat rotary planing machines, portable boring cars, planers, tools, &c., have been shipped to various other customers.

The Philadelphia Roll & Machine Works is melting a larger tonnage than ever before in its history. The demand for charcoal iron castings of all kinds has been very heavy, and orders for a large number of chilled and sand cast rolls varying in weight from 2 to 10 tons each have been received, as have also orders for heavy machinery and engine beds, and for large flywheels. Several complete equipments of rolling mill machinery for rubber and for iron, steel and other metals are also in course of construction, and every department of the plant is being operated at its utmost capacity.

The Baldwin Locomotive Works is busy in every department. Among the recent orders received was one for 20 freight locomotives of the consolidation type for the Argentine Great Western Railroad, Argentine, South America. Additions to the new foundry plant at Eddystone, Pa., are rapidly being pushed by the Baldwin Works. Four hundred and fifty men are now employed by them at that plant, and with only a portion of the old plant in operation nearly 400 tons of finished castings were shipped to the local plant last week. This tonnage will be largely increased as the additions to the foundry are completed, and it is the intention of the company to eventually do all the gray iron work at the new plant and to discontinue the present foundry at the local plant. Work on the new smith shop at Eddystone is also progressing satisfactorily and the removal of the brass shop to the new location is now under consideration.

The Wm. Cramp Ship & Engine Building Company successfully launched the steamship Katahdin on August 2. This vessel is building for the Clyde line and is 283 ft. long, of the three deck type and supplied with triple expansion engines of 1200 i.h.p. Her contract speed is about 12 knots per hour.

The Energy Elevator Company has shipped a large hand power freight elevator for export to Japan, this being the third of the kind it has exported to that country. A steam power passenger elevator in being installed at Trenton, N. J., while a hand power freight lift has been erected in the Wilmington shops for the Pennsylvania Railroad. The demand recently has been largely for elevators of the hand power freight type. Among recent deliveries of heavy hand power elevators by this company may be noted shipments to Lubec, Maine; Hartford, Conn.; Elkins, W. Va.; Starkville, Miss., and Clemens, Iowa.

Government Purchases.

WASHINGTON, D. C., August 7, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 28 for a band saw, gap lathe, boring mill, grinders and steam engine for the Portsmouth and New York navy yards.

Bids will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, until September 11, for the following machine tools for the Mare Island Navy Yard: Lathe, band saw, steam hammer, 5-ton derrick and fittings.

Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 21 for a valve reseating machine and other supplies for the Pensacola and New Orleans navy yards.

The Isthmian Canal Commission will soon ask bids for two turret lathes and miscellaneous supplies.

The Isthmian Canal Commission will receive bids until August 16, circular No. 321, for earth spreaders, boilers, pumps and other supplies.

The following bids were opened July 28, circular No. 318, at the office of the Isthmian Canal Commission:

Bidder 27, Handlan Brick Mfg. Company, St. Louis, Mo.; 40, Manning, Maxwell & Moore, New York; 43, Motley, Green & Co., New York; 46, Niles, Bement, Pond Company, New York; 71, Fox Bros. & Co., New York.

Class 31. One bending roll—Bidder 27, $3900, $2700; 40, $3567.50; 43, $3710; 46, $3016, $2665; 71, $2700.

The following bids for supplies for the navy yards were opened July 31:

Bidder 1, American Woodworking Machinery Company, New York; 13, F. S. Banks & Co., New York; 18, Babcock & Wilcox Company, New York; 48, Drew Machinery Agency, Manchester, N. H.; 53, Fox Machine Company, Grand Rapids, Mich.; 59, General Electric Company, Schenectady, N. Y.; 63, Wm. D. Gill & Son, Baltimore, Md.; 64, R. W. Geldart, New York; 69, Handlan-Buck Mfg. Company, St. Louis, Mo.; 98, Manhattan Supply Company, New York; 99, Montgomery & Co., New York; 105, Manning, Maxwell & Moore, New York; 124, Oil City Boiler Works, Oil City, Pa.; 125, Oliver Machinery Company, Grand Rapids, Mich.; 132, S. M. Price Machinery Company, Norfolk, Va.; 137, J. B. Roache, Brooklyn, N. Y.; 144, Smith-Courtney Company, Richmond, Va.; 158, Sherman-Brown-Clements Company, New York; 171, Vermilye & Power New York.

Class 21. Twelve marine boilers for United States Steamship New York—Bidder 18, $174,500; 124, $148,800.

Class 22. Eight marine boilers for United States Steamship Massachusetts—Bidder 18, $104,040; 124, $90,160.

Schedule No. 49.

Class 191. One valve reseating machine—Bidder 13, $325; 48, $325; 64, $325; 69, $325; 98, $325; 99, $325; 105, $325; 132, $325; 137, $325; 144, $325; 158, $325.

Class 192. One arbor press—Bidder 48, $37; 69, $34; 99, $35; 105, $33.90; 144, $37.50; 171, $45.

Class 195. One wood planing machine—Bidder 1, $225; 48, $260, $250 and $224; 63, $274.50; 59, $240; 105, $204.60; 125, $270; 144, $238 and $258; 171, $228.

Class 196. Two portable cranes and hoists—Bidder 13, $194.95; 69, $195; 98, $218.40; 144, $238.40.

Class 197. One wood trimmer—Bidder 53, $99.50; 105, $93.75; 125, $170; 144, $104.

Class 198. One mitering machine—Bidder 53, $79.90; 69, $59 and $91; 105, $75.75; 125, $99.

Under bids opened July 24 for machinery for the navy yards the following awards have been made:

Fairbanks Company, New York, class 31, one motor driven hammer, $650.

Babcock & Wilcox Company, New York, class 61, two marine straight water tube boilers, $11,850.

John B. Roach, Brooklyn, N. Y., class 103, four hydraulic jacks, $140.47.

Gamwell & Wheeler, Seattle, Wash., class 105, one valve reseating machine, $325.

Newton Machine Tool Works, Philadelphia, Pa., class 191, one No. 1 Newton combined cold saw cutting-off machine, $976.

The Lammers-Shilling Company, Heyworth Building, Chicago, has been organized with Herman C. Lammers president, and J. Lenhart Shilling, secretary and treasurer. The company will make a specialty of designing and engraving and the production of printing specialties. The officers named were formerly associated with the Binner-Wells Company, Mr. Lammers having served 17 years as designer and art director and in the capacity of vice-president, while Mr. Shilling was secretary and superintendent of the engraving plant, his connection with the company extending over a period of 14 years. A specialty will be made of the drawing and retouching of machinery and mechanical parts, bird's-eye views, designing, oil and water color painting, planning and illustrating of catalogues and booklets and full page advertisement designing.

One of the latest methods of disposing of garbage is to burn it under boilers for the purpose of making steam for power uses. In the plant in the outskirts of Zurich, Switzerland, there are 12 furnaces, each capable of burning 120 tons of garbage per 24 hr. Wagons containing the fuel are lifted by a derrick to a platform from which the contents are discharged into hoppers and thence delivered to the furnaces. For the necessary draft a strong blast is furnished by an electric blower, the air being heated by its passage through flues in the furnace walls before being delivered under the grates. Sufficient heat is furnished to run two large boilers at a pressure of 120 pounds per square inch, the power being used for generating electricity. About one-third of the original weight of the garbage remains as slag, which, mixed with lime, is used for making bricks and paving blocks.

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HARDWARE

THERE are few who do not theoretically at least recognize the desirability of a vacation or summer holiday, affording an opportunity for rest and pleasure and the brightening and broadening influence of a change of scene. A few indeed, like the multimillionaire who recently left behind a great fortune which he accumulated but never utilized, may boast that they never take vacations and may refuse to grant them to those of whose time and service they are masters. The great mass of sensible business men, however, hold sincerely to the conviction that a summer rest is desirable and endeavor to give a brief holiday to their employees, as well as to enjoy one themselves. But with many of them it is an easier matter to arrange for the vacation of their working force than to take one themselves, breaking away from the surroundings and cares of business, entering new scenes and taking up new occupations of a congenial and pleasurable character. The enjoyment and recreation thus permitted are indeed wisely regarded as good in themselves, but as having also a certain commercial value; furnishing a preparation for better work, giving a greater alertness and vigor of mind, more enthusiasm in taking up the old tasks and entering upon the new ones, and a larger endowment of the faculty of initiative, which is to so great an extent the secret of the best and most successful work. Notwithstanding all these considerations and the sound theory sincerely held, it is often a difficult matter for the business man, be he merchant or manufacturer, to make his escape from care and labor.

Sometimes with a pardonable overestimation of his own importance he may deem that his presence is essential in supervising and directing things, or if he succeeds in leaving the store or factory he finds that the perplexities of business follow him, his thoughts running in the old, too well worn channels, with the possibility that the habit of work has become so much a second nature that he is discontented if not busy at his accustomed tasks. Obviously under these conditions there is usually something wrong in his methods or attitude. The man who has no work to do is to be pitied, but nearly as much entitled to pity is the man who can do nothing but work, to whom recreation is distasteful and leisure a burden. Of these unfortunates there are more than one would suppose. They do not all survive to reach the withered old age which is their legitimate goal. There are many wrecks along the path they travel.

If the obstacle to a vacation for some who fortunately have the inclination and the ability to enjoy one is the difficulty of leaving the business without their immediate presence and direction, the question is brought up as to whether there is not a serious defect in the use made of the ability of their employees or in the lines on which the business is conducted. In many such cases the man at the head of the enterprise is doing work which might be intrusted to others with advantage to him and to them, as well as to the business itself. In this way the general principle is suggested that a great many business men hamper themselves and hinder the business by being too much occupied in the ordinary and detailed routine. The recognition of the duty of taking vacations thus enforces a fundamental and most fertile principle, the influence of which should be felt in every department of the business. If it is recognized as it should be there will be an opportunity for the head of the concern to get away for a time. The machine will not stop when he leaves it.

When, however, a vacation is taken it must be with a free and unburdened mind. The merchant or manufacturer must leave behind him the care and perplexity of the store or factory. Worry and anxiety and the grinding over of the old vexations must be laid aside, and the unsolved problems of business deferred and its cares and annoyances forgotten. With the change of scene there must be a new mental atmosphere, and the cells of the brain and the muscles of the body be given new and congenial work, so that there may be an invigorating of the whole system, so that in addition to the pleasure it confers the outing may be a veritable recreation, a making over on new and better lines.

In all this there is not only enjoyment, but good business. Most heartily do we commend the vacation spirit to those who have to do with so complex and diversified interests as those represented in these columns, in the hope that they may enjoy a suitable respite from business cares and find the pleasure, the relaxation and the renewing the summer holidays afford and permit as far as possible those associated with them to enjoy similar privileges and benefits. In this way the summer, if put to a wise use, may show its fruitfulness in all the months that follow.

Condition of Trade.

No alteration in market conditions and tendencies has been observed since our last report. July figures, having been made up, are generally referred to as constituting a record for that month. Business continues in sustained volume and activity is not confined to any special lines, orders being seemingly intended to cover current general requirements. Jobbers in all sections are enjoying a splendid trade which they are hard pressed to take care of, while their forces are still depleted by the vacation season. Increased activity is noted in the Southwest, and especially in the South, where the outlook is marked by exceptional promise. The weather has been highly favorable to the maturing crops as well as for the harvesting, which is now under way in many sections. Reports from all parts of the country show a noticeable absence of complaint regarding collections, in spite of the monetary problems talked of in financial districts. Manufacturers have seldom, if ever, had so much business on hand at this season of the year and, in fact, are considerably behind their orders on standard lines, which usually during the summer months they are heavily stocked up on. They have also missed their accustomed opportunities for making necessary repairs and improving and enlarging their plants. Some apprehension is expressed as to the effect of this continued strain upon productive resources, but it is doubtful if the country's capacity was ever greater or more reliable than it is to-day. Prices continue firm but steady, with an occasional slight change which is often in the nature of a stiffening or a withdrawal of concessions rather than an actual advance. Inquiries are fre-

quent on goods which will shortly come in season, and there is a disposition and even an anxiety to get covered before possible advances. At the same time buyers are a little chary of placing contracts for their requirements in anticipation of higher prices, as some have unfortunately demonstrated within the past year that shipments of market orders are surprisingly prompt as compared with specifications against contracts placed at lower figures. While the prospects indicate a heavy volume of fall business, it is likely that the movement on some seasonable goods will be lighter than usual on account of the mildness of last winter, which resulted in carrying over considerable stocks of these lines.

Chicago.

While there has been a slight easing off in current demand the early buying for fall consumption is brisk, and the outlook for a continued heavy trade in all lines of Hardware is exceedingly bright. Merchants are already placing orders for fall and winter goooods to insure satisfactory deliveries, and are buying heavily to cover their requirements. Having underestimated their needs during the spring and summer season, many merchants were confronted with depleted stocks when the demand was at its hight, and to prevent a repetition of this situation their future purchases are in such volume as will amply provide for the increment of consumption over the same period last year. The heavy summer trade has still further delayed manufacturers' shipments, and jobbers are experiencing increased difficulty in maintaining stocks. This not only applies to seasonable goods, but to Shelf Hardware as well, the midsummer demand for the latter being unprecedentedly heavy. Building operations continue to be delayed, owing to the shortage of Builders' Hardware, and most of the makers are from two to three months behind on shipments. The July building record of the City of Chicago is far ahead of the same month a year ago, permits having been issued for 934 buildings, involving a total cost of $4,849,960, against 768 buildings, at a cost of $3,778,390, in July, 1905. The cost of operations undertaken during seven months this year is ahead of all previous records, amounting to $41,339,105, and is an increase of nearly $7,500,000 over the same period last year. A proportionate increase is also shown at all large centers throughout the West and Northwest, while St. Louis is experiencing the biggest building boom in its history. Builders are also being educated to the use of better grades of Hardware, and the growth in the demand for brass and bronze fittings is notable. The scarcity of desirable woodstock enables producers to maintain record prices, and no relief is promised the wagon manufacturers in the near future. There is also a shortage of Trace Chains, and jobbers' stocks are at a low ebb. Shipments of Wire products are already going forward, distributers hurrying deliveries much earlier than in former years, to avoid the congestion at the mills during the months of September and October.

NOTES ON PRICES.

Wire Nails.—Contract orders are being placed with manufacturers for liberal quantities, and prompt shipments are requested. Stocks in manufacturers' and jobbers' hands are reported light, and a shortage of Nails for the fall trade is considered a possibility. The shortage of steel is restricting the output of mills to some extent. With the exception of concessions of 5 cents per keg occasionally made on large orders the market is firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash fn 10 days:

Carloads to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—Since the first of the month the demand for small lots from store has been somewhat lighter than during July. Quotations for small lots from store are on the basis of $2.10 per keg.

Chicago.—The heavy bookings not only of Wire Nails but of Wire products generally during the month of July reflect the strength of the entire situation in Wire products. The total tonnage booked by the leading interest was almost twice as great as during the same month last year, and specifications received were far in excess of the daily averages of any previous midsummer month. A phenomenal record has already been established thus far in August, the total tonnage taken on one day last week surpassing all previous records in the history of the American Steel & Wire Company. All of its available capacity for which steel can be secured is in operation, and a scarcity of labor is to some extent hampering operations. Large distributers are insisting upon prompt shipments of practically all of the material for which specifications are now being received, and the indications are that the trade will be confronted with a shortage during the fall months. Quotations are firmly maintained on the following basis: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Orders are being placed very freely, and mills are running as full as they can with the limited supply of steel. Nothing is learned yet of the advance which is expected in some quarters. The market remains very firm, subject to the concession of 5 cents a keg made on large orders. Official prices, which are shaded to this extent on desirable orders, are as follows: Wire Nails, $1.85 in carloads to the large jobbing trade and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—The demand on the mills is good in the form of specifications on contract orders, while new orders for future shipments are being placed to some extent. Some mills ran behind their orders during the July shutdown for repairs and inventory, and other mills are short on some sizes. Scarcity of Steel and the difficulty of obtaining it are reducing the production of Nails to some extent. Concessions on official prices of 5 cents per keg, f.o.b. Pittsburgh, are understood to be more or less general. Official quotations are as follows: $1.80, base, for carload lots, f.o.b. Pittsburgh; $1.85 for less than carloads, f.o.b. Pittsburgh; $1.95 for carload lots, on dock, New York; $2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—Requirements for Cut Nails are comparatively high for small lots from store, but still about in proportion to the demand of Wire Nails. Quotations for small lots from store are on the basis of $2 per keg.

Chicago.—Railroad work is taking a fair tonnage, but otherwise demand is light as usual at this season. The following quotations prevail: Steel Cut Nails in car lots, $1.90 to $1.95; less than car lots, $2; Iron Cut Nails, $2 to $2.05 in car lots; less than car lots, $2.10.

Pittsburgh.—The demand continues very good, with stocks in the hands of jobbers and retailers light for this season. Specifications are being placed very freely and mills are busy. We quote Cut Nails at $1.75, base, f.o.b. Pittsburgh, for carload lots, and $1.80 in less than carload lots. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

Barb Wire.—Contract orders are now being placed for fall delivery, and specifications from sources outside the Hardware trade are being received for shipment. In some cases concessions on carload and larger lots of 5 cents per 100 lbs. are made. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

	Painted.	Gal.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—Contracts are now being placed by large jobbers for material to be shipped during the fall months, and the railroads continue to specify freely for material for prompt shipment. The production, notwithstanding the growing use of Woven and Smooth Wire Fencing, is constantly increasing, the output of the mills thus far this year

being greater than during the first seven months in 1905. Quotations are firmly maintained as follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45. To retailers, car lots, Painted, $2.20; Galvanized, $2.50. Retailers, less than car lots, Painted, $2.30; Galvanized, $2.60; Staples, Bright, in car lots to jobbers, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Buying is very good on all hands for the fall trade. The official prices, which are occasionally shaded 5 cents on desirable orders for carload and larger lots, remain as follows: Painted Barb Wire, $2, and Galvanized, $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—Specifications on contract orders and the placing of new orders for future shipments are both in good volume. The market is fairly well maintained at official prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Woven Wire Fence manufacturers continue to place contracts for future requirements covering periods of six to twelve months and specifications for Wire for manufacturing purposes thus far this month are equal to the daily average during July. Quotations are well maintained as follows: Jobbers, $1.85, f.o.b. Chicago, in car lots; retailers, $1.90.

Pittsburgh.—Specifications are good from all sources, and the Fence manufacturers are preparing for a very large business this fall. Prices are quite firm, but are occasionally shaded 5 cents per 100 lbs. on desirable orders. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Roller Skates.—The widespread revival of roller skating has led to a large increase in the demand for Roller Skates. Deliveries are very slow, as leading manufacturers are far behind their orders and their facilities are inadequate to the surprising business offered them. In some sections the popularity of the sport amounts to a positive craze and bids fair to increase during the fall and winter.

Flour Sifters.—There has been a stiffening in prices on Flour Sifters. Some makers who were offering these goods a little below the market have recently advanced their quotations and it would appear that the prices of leading manufacturers are now established on a uniform basis.

Coil and Halter Chain.—A slight advance was made last week in German Coil and Halter Chain. Prices now quoted by manufacturers are about 5 per cent. higher than those previously ruling.

Rope.—The market for Manila Rope is somewhat stiffer upon the report of a shortage of Manila Hemp of some proportions. No change has been made in the price of Rope, but the additional firmness is shown by the unwillingness of manufacturers to make concessions from regular quotations on large and desirable orders. So far this month demand has not been as good as it was during July. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9 cents; No. 2 quality, 7¾ cents per pound.

Window Glass.—According to reports the American Window Glass Company has disposed of the stocks which it has been carrying in Chicago to large Chicago jobbers, and has discontinued its distributing branch in that city. The Colburn Machine Glass Company, it is understood, has been incorporated in Camden, N. J., with an authorized capital of $500,000, of which $1000 has been paid in. Manufacturers and jobbers report business as somewhat quiet. Quotations from jobbers' list in this section are as follows: Greater New York, single, 90 and 5; double, 90 and 10 per cent. discount. Eastern District, except the Boston District, 90 and 10 per cent. discount, for all sizes of single and double strength. In the Boston District quotations are reported as being 90 and 15 for all sizes of single and double strength.

Spirits Turpentine.—Since August 4, the local market has been steadier, in sympathy with improved conditions at Savannah. The local demand has improved and a fairly good business has been done at this point at advanced prices. New York quotations are as follows, according to quantity: Oil Barrels, 61 to 61½ cents; Machine Made Barrels, 61½ to 62 cents per gallon.

ASSOCIATION NOTES.

DURING the past few months, we are advised, the members of the North Dakota Association have shown much more interest and activity in the work of the organization than ever before. This association embraces a very large proportion of the Hardwaremen of the State, and since its formation the membership has shown a steady increase from month to month and year to year.

Paul W. McLure, Greenwood, secretary of the South Carolina Retail Hardware Association, has just commenced a tour of North and South Carolina with a view to increasing the membership of the organization and if possible bringing about its development into the Retail Hardware Association of the Carolinas. Mr. McLure has given up all other occupation and will devote his entire time to the work of organization. It is to be hoped that his energetic canvass of the two States will result in a large accession to the membership roll.

AMONG THE HARDWARE TRADE.

J Krebs has purchased the business of McKillip & Swallow in Humphrey, Neb., and will conduct a general Hardware business.

The Hardware, Stove, Implement, Paint and Sporting Goods business of Everett, Kyle & Epperly, Lebanon, Ore., has been incorporated.

The store of Miller & Durst, Kalona, Iowa, was recently destroyed by fire. The loss is estimated at $7000, which was largely covered by insurance.

Edwin Metcalf has succeeded to the Hardware, Stove and Tinware business of Clegg & Metcalf, Greenwood, Neb.

Gaines Hardware Company, Lake Village, Ark., has been incorporated with a capital stock of $40,000.

M. H. Mallett has succeeded to the Hardware, Paint and Sporting Goods business of Straub & Mallett, New Milford, Conn.

Walter Scott, Waynesburg, Pa., has sold his Hardware business to Luce Bros., who will assume charge about the first of September.

The Frank Gilbert Supply Company, Sharon, Pa., General Hardware and Builders' Supplies, announces that the stock will be sold off and the business discontinued as soon as possible.

R. A. McClean & Son have succeeded to the Hardware business at Uniontown, Pa., formerly conducted by J. L. Malcolm.

Strahle & Smith, Sargent, Neb., have been succeeded in the Hardware, Stove and Sporting Goods business by C. A. Strahle.

TRADE WINNING METHODS

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

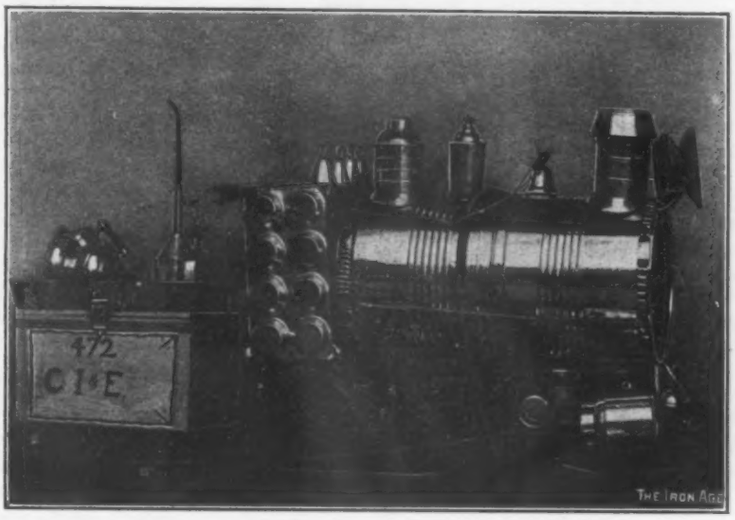
INDIANA CARNIVAL HARDWARE EXHIBITS.

DURING the recent carnival at Petersburg, Ind., the Boonshot Hardware Company of that city attracted a good deal of attention by show window displays, which are illustrated herewith. The striking feature of one window was the reproduction in Hardware goods taken from stock of a locomotive and tender, while the other was made conspicuous by a Ferris Wheel, also contrived from Hardware. Mr. Myers, one of the clerks in the store, is to be credited with the arrangement of the displays.

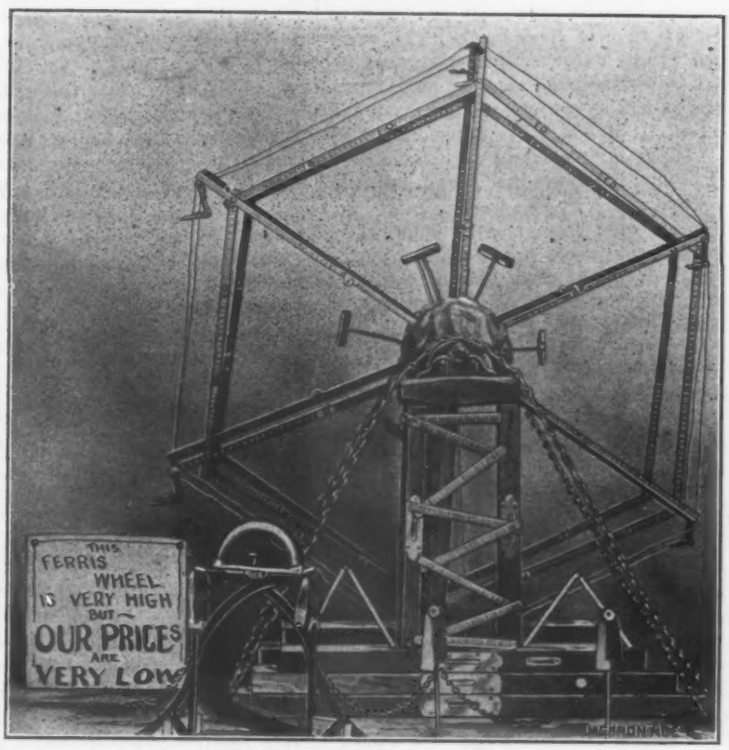
The locomotive and tender together were 7 ft. long and 3 ft. high, and consisted of Well Wheels, Hay Pulleys, Lard and Milk Cans, Measures, Dog Collars, Bread Boxes, Carpet Sweepers, Drip Pans, Strainers, Gem Pans, Ice Cream Dishers, Dust Pans and Cuspidors. Barndoor track furnished the rails, the ties being Crosscut Saw Handles.

The Ferris wheel was arranged to revolve, and in addition to the card shown in the lower left-hand corner of the illustration there was another in the window announcing that "The Ferris Wheel Runs Every Five Minutes." The wheel was made up of one, two, four and six-foot rules. The axle was a 12 by ½ inch. bolt, running on bearings of a pair of Grindstone Fixtures. These rested on two coal Sledges, which in turn were supported by the main tower, made up of Spirit Levels. The whole structure was supported and braced by two halter chains. The fence which enclosed the grounds had Ice Picks for posts, carrying Jack Chain. The gateway was formed out of Shelf Brackets, surmounted by Sad Iron Handle.

All in all, the exhibits, we are advised, created more talk and secured more attention than anything of the kind heretofore exploited in the town, and the firm was much gratified with the business results of the publicity thus obtained. The Boonshot Company will be pleased to furnish any further particulars in regard to the displays which may be desired by other merchants looking for window exhibit ideas.



Locomotive and Tender.



Ferris Wheel.

GAGE HARDWARE COMPANY, Indianapolis, Ind., has recently commenced the publication of a store paper under the style of the "West Indianapolis News." The first number comprises four pages, about 9 x 12 in. The front page presents a view of the store. The inside pages call attention to a few seasonable selections from the company's stock. The back page is devoted to wit and humor, a feature which was doubtless appreciated by the parties receiving the paper.

ONCE a month the J. J. Danek Estate, Silver Lake, Minn., issues a large poster in the interest of its retail business in Hardware, Paints and Oils, Stoves, Sporting Goods, Lime, Cement, &c. A recent poster called attention to Enameled Ware, Stoves, Sewing Machines, Screens, Food Choppers, &c., which were illustrated and priced. The poster was embellished with a very attractive border suggestive of the picnic season, the intimation being given that "it's a picnic to buy your Hardware at this store."

WILLIAM J. H. GLUCK, wholesale Stoves, Tinware, &c., 218-222 N. Gay street, Baltimore, Md., was thirty-one years in business on the 8th inst. With a view to celebrating the anniversary in "a practical and unique manner," Mr. Gluck sent out a circular inviting all of his customers to send him an order to reach him on or shortly before the 8th. As an inducement on all such "anniversary orders," as Mr. Gluck appropriately termed them, an extra discount of 5 per cent, was allowed.

EUGENE GOODWIN, secretary of the Pacific Coast Hardware and Metal Association, announces that the office of the association is now in the Monadnock Building, San Francisco, the temporary quarters in Oakland having been abandoned.

ADVERTISING SPORTING GOODS—DOES IT PAY?

BY HAMMERNAIL.

The handler of Sporting Goods located in a small city often asks himself whether or not he gets back the money spent in advertising.. No doubt there are some who are absolutely sure that they do; who see the direct returns for money spent. But the great majority probably regard the advertising solicitor as an enemy from whom they would like to flee.

From the way in which those dealers place and write their advertisements, it is little wonder that they feel the expenditure is wasted; it probably is. But because some advertising does not pay or because it may be that at times immediate results do not follow, all advertising for the merchant in Sporting Goods should not be condemned.

MANY a man has become rich through the constant use of newspaper advertising—not perhaps in the Sporting Goods line—but the same principles will apply to the success of this as well as any other business.

All Men Not Sportsmen.

It is true that the field of prospective buyers is much more limited here than in many other lines. The dry goods merchant is selling something every day that appeals to almost every woman, the shoe dealer knows that every person passing his door or reading the paper must wear shoes, and is therefore a possible customer. But the Sporting Goods dealer must realize that only a portion of the entire male population of his city are sportsmen, and his advertising therefore must be placed with greater care than that of almost any other merchant.

How to Reach the Sportsmen.

In advertising the retail Sporting Goods business the problem is, therefore, how best to reach those who do use Sporting Goods—the sportsmen—and how to increase the number of users of these goods. The same rate will be charged by the daily newspaper for the Sporting Goods dealer's advertisement, read by only 1 per cent. of the readers, as will be charged the dry goods merchant whose ad. is read by 50 per cent. Therefore the Sporting Goods dealer is paying, we might say, five times as much for his space, and it follows that his ad. ought to be five times as effective.

Properly used, there is little doubt but that advertising in the local papers can be made to pay. To announce the simple fact that a big line of Sporting Goods can be found at the merchant's store is not the best way to get business. Every advertisement should carry the notice of some particular kind of goods. The time to put the most energy into this work is just before or during the season when the goods advertised are to be used. Fishing Tackle should be advertised during early spring and summer, Gun Goods during the open hunting season.

Keep a List of Sportsmen.

One of the most effective and best paying schemes of advertising is by letter or circular sent to the users of Sporting Goods. This local list can be started by taking the members of fishing and shooting clubs, and can gradually be increased by keeping a record of the customers of the store. Such letters or circulars should be carefully gotten up—should be short and to the point, and should call especial attention to seasonable new goods.

One dealer who has built up a large local business, starting only a few years ago in a comparatively small way, has done it almost entirely by following closely this method of advertising. Most doctors are sportsmen; many lawyers and ministers are interested in outdoor life, and taking this for his starting point he has so well worked up his business that all this class of professional men have become good friends of his and are constantly looking for a note from him calling attention to something new.

Furnishing News.

Properly written reading notices will be found to be good business breeders. Furnish seasonable Rifle or Gun news to the local papers. Put yourself out to get such news. Keep the local paper posted as to the game laws; as to any especially good fishing or hunting. And the local paper will not find fault if now and then your own name appears. People who use Sporting Goods are continually furnishing material for local newspaper mention. Keep informed about what the sportsmen are doing, and make it your business to keep the local papers posted. You will find that they will be glad of your efforts and will co-operate with you.

If the average business man bought and sold goods in the same thoughtless, slipshop manner as he writes and places his advertising there would be many more failures than there are. Advertising is becoming more and more one of the recognized departments of business.

"What do you mix with your Paints?" was asked of a great artist. "Brains," was the reply. "What do you use in the making of your business?" The successful man will answer, "Hard work, continual effort and brains." It is the use of the same factors that will make the advertising of Sporting Goods bring results.

TRADE ITEMS.

THE HUMPHREYES MFG. COMPANY, Mansfield, Ohio, has adopted a new label, which will be attached to every piece of guaranteed sanitary Enameled Ware which leaves the factory. This label has been registered at Washington and guarantees the ware to be first quality in durability, design and finish.

TAYLOR & SPOTTSWOOD COMPANY, Iron, Steel, Blacksmiths' Supplies, and Carriage and Wagon Materials, is now permanently located at Minnesota and Nineteenth streets, San Francisco, Cal.

BURHANS & BLACK COMPANY, Syracuse, N. Y., has purchased the stock of John B. Foley & Co., together with the good will of the business. The company intends to make a first-class retail store of the Foley concern, and will carry a large stock of fine Hardware. It will possess the advantage of drawing from the company's extensive wholesale establishment. The management of the store will be given to John B. Foley, who is well known in that section of the State, and, indeed, throughout the State, as the secretary of the New York Retail Hardware Association. Mr. Foley's long experience as a Hardware man, together with his attractive personality, are counted on to make the business a success.

HENRY L. SAWYER, South Framingham, Mass., a prominent Hardware merchant, was killed July 23 in the collapse of a building which was in process of construction in that place.

COES WRENCH COMPANY, Worcester, Mass., J. C. McCarty & Co., 10 Warren street, New York, and John H. Graham & Co., 113 Chambers street, New York, selling agents, is just putting on the market a 4-in. Steel Handle Wrench of the same pattern as the larger sizes, with which the trade is familiar. It is believed that this tool will be a popular addition to the Coes line, the 6-in. Wrench being the smallest previously offered. It is furnished in mottled or steel blued known as gun finish and lists at $8, subject to the same range of discounts as allowed on regulation sizes.

PITTSBURGH SHOVEL COMPANY, with offices in the Frick Building, Pittsburgh, and plant at Leechburg, Pa., has opened a New York office at 103 Reade street, which will be under the care of D. B. McIlwaine, who is well known to the trade. A stock will be carried for the convenience of customers. The company manufactures Shovels, Spades, Coal and Grain Scoops, Post, Ditching and Draining Tools, &c. Handles of its own manufacture are used, and the different departments are under the care of practical men of experience.

Post & Duncan, Hardware merchants of Auburn, N. Y., have dissolved partnership, John H. Post succeeding to the business.

Parcels Post and Rural Free Delivery.

FROM OUR SPECIAL WASHINGTON CORRESPONDENT.

WASHINGTON, D. C., August 7, 1906.

THE Fourth Assistant Postmaster-General has made public an interesting statement showing the status of the rural free delivery service by States at the beginning of the current fiscal year, which is especially timely in view of the concerted movement which the mail order houses appear to have undertaken since Congress adjourned to develop sentiment in favor of a domestic parcels post through the farmers of the country during the Congressional recess. A number of mail order publications and advertising periodicals have joined in the movement, and the farmer is being urged to tell his Senators and Representatives about the benefits he has enjoyed as the result of the establishment of rural free delivery, as a basis for a further demand for parcels post.

Gross Misrepresentation.

For the purpose of encouraging the farmers to make this demand the sentiment in Congress respecting the so-called postal "reforms" is being grossly misrepresented. One of the publications referred to, in speaking of Representative Henry's parcels post bill says :

> At one time last spring the Committee on Post Offices and Post Roads of the House thought seriously of reporting favorably this bill, but it hesitated because retail merchants in several States protested that the legislation would be of special benefit to the mail order houses. Possibly it would be of benefit to the mail order houses, and *that is one of the reasons the farmers are demanding it.* Eventually their demands will have to be heeded by Congress. Within the next two years the rural free delivery service will be practically complete in the United States, which will mean that a rural carrier with a horse and wagon will visit daily every rural community in the country that has passable roads.

Here is a frank confession that the farmers are demanding a parcels post because it would be of benefit to the mail order houses, while the Post Office Committee of the House hesitates because "retail merchants in several States" are protesting against it. This makes the issue so clear and sharp that he who runs may read, and it will no doubt bring a feeling of gratification to the Hardware retailers who fought the good fight last session that resulted in the defeat of the Henry bill.

But every retail merchant should read the following statement of the

Probable Effect of a Parcels Post

on the country storekeeper:

> The establishing of rural delivery has brought the farmers of the country nearer the world. It has increased their wants many fold. They are buying things they never thought of buying before. One of the chief arguments in favor of a parcels post is that the village merchant does not keep in stock goods the farmers frequently want. With a parcels post law in force, it is pointed out, the farmer on the rural route would be able to deal directly with the large mail order houses more advantageously than at present. The advocates in Congress of a parcels post insist that the local merchant would not be injured. Attention is called to the fact that the farmer will on all occasions prefer the local merchant, provided the articles he wishes to purchase can be had in the home store. Advancing as they are, the farmer and the members of his family will send away for things they want if they are not to be had at home. The effect of the parcels post would be to induce the local merchants to carry articles in stock which they do not carry, and would afford the rural dwellers a handy method of securing goods away from home if the local merchants did not choose to carry such goods in stock.
>
> In the estimation of many thoughtful public men the universal establishment of rural free delivery makes it imperative that the Government give the farmers a parcels post law. Letters received by members of Congress from practical farmers point out that during the summer season, when the farmers are so busy that they cannot take the time to go to the village or town, the parcels post would be of great advantage. "Suppose I am threshing," said an Ohio farmer in a letter recently, "and we have a breakdown—a casting weighing 5 lb. breaks. Under the existing regulations the rural carrier cannot be of any service to me, because he is forbidden to carry a package. The result is that we must suspend work while I go to the nearest city in which the broken casting can be duplicated. Possibly two or three days will be wasted. If we had a parcels post I could wire the dealer in the nearest city, the duplicate casting could be mailed, and the rural carrier would bring it to me on his next trip.

In a nutshell, therefore, it appears that the retail merchant would be driven by the parcels post to carry in stock practically every article to be found in the catalogues of the big mail order houses. The farmers would thus "educate" the country storekeeper by demonstrating to him that the only way to hold the home trade is to establish a local store as big and comprehensive as the giant concerns in Chicago and elsewhere.

Ignorance of the Present Regulations

has led this writer into an error which "gives him away." In quoting "an Ohio farmer"—doubtless an imaginary one—he makes him say that the rural carrier is forbidden to carry a 5-lb. package. Now a 5-lb. package is exactly what the rural carrier is permitted to carry. The regulations provide that he shall not carry free or for hire any package which can be mailed, and inasmuch as the limit of weight of merchandise by mail is 4 lb. the department holds that upon the order of a patron of his route a rural carrier can deliver any package weighing more than 4 lb. Thus the "Ohio farmer" who wants a 5-lb. casting can order it by telegraph, have it sent to the nearest express office and have the carrier bring it out for a small fee, usually about 10 cents. If the casting does not weigh more than 4 lb. the farmer can have it sent to him by mail at a cost not to exceed 64 cents, which is certainly not a high price to pay to prevent the wasting of three or four days of valuable time. It seems to be hard work to manufacture illustrations designed to show the overshadowing interest of the farmers in what is really the campaign of the mail order houses.

Growth of the Rural Free Delivery Service.

Inasmuch as the alleged success of the rural free delivery service is made the basis of these arguments, designed to arouse the farmers to demand of Congress a domestic parcels post, the Fourth Assistant Postmaster-General's report on the growth of this service during the past year and its enormous cost to taxpayers at large will be of unusual interest.

On July 1 of last year 32,055 routes were in operation, while on the same date of the current year the number was 35,768, showing the establishment in the fiscal year just ended of 3,713 routes. The State of Illinois leads the list on July 1, 1906, with 2,701 routes, as compared with 2,536 routes a year ago. Ohio stands second, with 2,424 routes, as compared with 2,275 on the corresponding date last year. Iowa ranks third with 2,264 routes, as against 2,107 a year ago. The following table shows the

Status of the Service in All States in Which 100 or More Routes Have Been Established.

States.	July 1, 1905.	July 1, 1906.
Alabama	525	716
Arkansas	193	278
California	233	255
Connecticut	229	236
Delaware	105	106
Georgia	1,181	1,378
Illinois	2,536	2,701
Indiana	1,978	2,122
Iowa	2,107	2,264
Kansas	1,463	1,564
Kentucky	564	638
Maine	398	421
Maryland	359	385
Massachusetts	232	248
Michigan	1,694	1,841
Minnesota	1,210	1,376
Mississippi	265	396
Missouri	1,614	1,824
Nebraska	873	909
New Hampshire	186	199
New Jersey	190	234
New York	1,653	1,725
North Carolina	975	1,150
North Dakota	131	188
Ohio	2,275	2,444
Oklahoma	532	640
Oregon	168	183
Pennsylvania	1,778	1,986
South Carolina	476	569
South Dakota	249	354

States.	July 1, 1905.	July 1, 1906.
Tennessee	1,376	1,533
Texas	1,320	1,518
Vermont	258	285
Virginia	731	836
Washington	160	194
West Virginia	163	225
Wisconsin	1,380	1,449
Other States	295	312
Totals	32,055	35,768

The Enormous Cost.

In connection with the above figures it is interesting to glance at the record of the last half dozen years, showing the number of routes and cost of service per annum. These statistics are embraced in the following table:

Year.	Number of routes.	Cost of service.
1901	4,301	$1,749,525
1902	8,466	3,003,706
1903	15,119	8,011,635
1904	24,565	12,640,070
1905	32,055	20,819,944
1906	35,768	25,828,300

The appropriation for the fiscal year 1907 made at the recent session of Congress for the rural free delivery service approximated $29,000,000, but a part of the increase was due to an allowance of 15 days' leave of absence, with pay, for all carriers, substitutes receiving full carriers' salaries during such leave.

From $406 to Nearly $800 Per Route.

While it will be gratifying to the merchants of the country to know that the rate of the expansion of the rural service is not likely to increase in the future, it is far from pleasant news to the taxpayers that the cost per route is steadily increasing. In 1901 the average was $406 per route, while on the basis of the number of routes now in operation and the appropriation made for the current fiscal year, the cost will average nearly $800.

A Heavy Drain on Taxpayers at Large.

At the present time the revenue from rural routes averages about $135 per annum, from which it will be seen that more than 80 per cent. of the cost of maintaininging this service is paid by the taxpayers at large. Of the appropriation for the current year, therefore, the general public will be taxed nearly $24,000,000 for the benefit of about 12,000,000 persons who receive their mail on rural routes and only pay a little more than 15 per cent. of the cost of the service to the Government.

W. L. C.

HOUSE FURNISHING EXHIBITION.

A HOUSE FURNISHING GOODS SHOW is being held this week in Madison Square Garden, New York, which is referred to as the first of a series of annual exhibits of this nature. The affair promises to be successful and highly creditable to those identified with its inception and promotion. It is expected to attract large numbers of buyers of these lines who are accustomed to visit the metropolitan market at about this time of year. Effective and in some cases elaborate exhibits have been installed by leading manufacturers, among whom the following are noticeable because of their large dealings with the Hardware trade:

Eagle Cooperage Company, Circleville, Ohio.
Searls Mfg. Company, Newark, N. J.
Pullman Mfg. Company, Rochester, N. Y.
Dover Mfg. Company, Canal Dover, Ohio.
Rochester Stamping Company, Rochester, N. Y.
W. G. Browne Mfg. Company, Kingston, N. Y.
National Sweeper Company, Newark, N. J., and Marion, Ind.
Davis Automatic Shear Company, New York City.
Holt-Lyon Company, Tarrytown, N. Y.
W. H. Sweeney Mfg. Company, Brooklyn, N. Y.
Geo. Borgfeldt & Co., New York City.
Chas. Weiland, New York City.
Adams & Elting Company, Chicago and New York.
Republic Metalware Company, Buffalo, N. Y.
Baltimore Stamping Company, Baltimore, Md.
Twentieth Century Mfg. Company, New York City.
Landers, Frary & Clark, New Britain, Conn.
H. & H. Mfg. Company, New York City.
Higgin Mfg Company, Newport, Ky.
Thos. W. Houchin Company, New York City.
National Mfg. Company, Worcester, Mass.
A. Kreamer, Brooklyn, N. Y.
Lisk Mfg. Company, Canandaigua, N. Y.
Atlantic Stamping Company, Rochester, N. Y.
Continental Company, Detroit, Mich.
Silver & Co., Brooklyn, N. Y.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price lists, &c., for our catalogue department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

THE CUTAWAY HARROW COMPANY, Higganum, Conn.: Illustrated pamphlet relating to Clark's Harrows, Grass Hoe, Weeder, Plows, Seed Drill and Plow combined, Cultivators, Tobacco and Cider Presses, Root Cutter, &c.

MODERN IMPROVEMENTS MFG. COMPANY, 466 Seventeenth street, Brooklyn, N. Y.: Pamphlet devoted to solderless Mimco Couplings.

TROY LAUNDRY MACHINERY COMPANY, Troy, N. Y.: Fifteenth edition catalogue, devoted to a large line of Laundry Equipment, including Power and Hand Devices.

PARRY MFG. COMPANY, Indianapolis, Ind.: Illustrated catalogue pertaining to Surreys, Phaetons, Buggies, Stanhopes, Drive, Road, Spring and Delivery Wagons.

WEBSTER COMPANY, North Attleboro, Mass.: Catalogue illustrating sterling silver ware and novelties, including Purses, Toilet Articles, Baby Rattles, Child's Cups, Pocket Match Boxes, Cigarette Boxes, Card Cases, Pocket Knives, Cigar Cutters, Scissors, Mirrors, Lorgnettes, Desk and Table Novelties, Bon Bon Sets, Dishes, &c.

HEEBNER & SONS, Lansdale, Pa.: Illustrated catalogue devoted to Horse Powers, Saw Machines, Threshers, Gasoline Engines, Ensilage Cutters, Harrows, &c.

THE SHERWIN-WILLIAMS COMPANY, Cleveland, Ohio: Catalogue devoted to Paints and Varnishes. This is in the form of a scrap book, with color folders attached to heavy leaves, having ruled spaces underneath each folder for cost and selling price. The book is designed to be placed on the retail merchant's counter or other conspicuous place.

BIGELOW & DOWSE COMPANY, Boston, Mass.: Leaves for insertion in the company's loose leaf catalogue. New pages 1 to 284 take the place of old pages 1 to 292, and cover the line of Builders' Hardware. The other pages include scattering insertions from 381 to 874.

THE HOWELL & SPAULDING COMPANY, Caro, Mich.: Illustrated catalogue relating to Howell's Adjustable Hameless Steel Horse Collars.

THE STANDARD SCALE & SUPPLY COMPANY, Pittsburgh, Pa.: New York office, 736 West Broadway: Illustrated descriptive catalogue in Spanish, relating to Scales.

CLEVELAND BUTCHERS' SUPPLY COMPANY, Cleveland, Ohio: Price-list of extra repair parts for Enterprise Hand and Power Choppers.

HENRY DISSTON & SONS, Philadelphia, Pa., advise us that they have been subjected to much annoyance as a result of claims made by a party in Toronto, Canada, that they had purchased from him a formula for a process of finishing Wood and Metal. Numerous letters have been received by them making inquiries as to the formula and the results of its use. They desire to state emphatically that they have had no communication with the person in question and have purchased nothing from him.

BELDING & FRANKLIN MACHINE COMPANY, 110 West Thirty-fourth street, New York, has been organized for the purpose of manufacturing the Economical Vegetable Peeling Machine, a machine designed for peeling potatoes, turnips, carrots, beets, parsnips, cucumbers, &c. The officers of the company are Capt. Thos. Franklin, U.S.A., president; George L. Belding, manager Cadet Laundry, U. S. Military Academy, West Point, vice-president; and Capt. L. M. Nuttman, U.S.A., secretary and treasurer.

DEATH OF DANIEL B. WESSON.

DANIEL B. WESSON of Smith & Wesson died at his home in Springfield, Mass., Saturday afternoon, August 4. Physically he had been failing for several years owing to advanced age, but mentally he was an example of vigorous manhood, and, indeed, had not been confined to his bed. The death of his wife July 18 last, between whom, their age being nearly equal, there was an exceptional sense of mutual affection and dependence, unfavorably affected him, as it was feared it would. Their married life extended over a period of nearly 60 years.

Daniel B. Wesson was born in Worcester, Mass., in May, 1825. Of English origin, the family of Wesson has flourished in America for fully two centuries, its early home being in the New Hampshire colony, where the original immigrants of the name appear to have first settled. Rufus Wesson, father of Daniel B. Wesson, was a grandson of Abel Wesson of New Hampshire. Attracted to Massachusetts by the workshops there, the father of D. B. Wesson early settled at Worcester, where he made a fine quality of Plows. Daniel shared with his father and elder brothers the taste for mechanics and invention, devoting his time about equally between duties on the farm and schooling. Of Daniel's four brothers, Edwin,

DANIEL B. WESSON.

the eldest, apprenticed himself to Silas Allen of Shrewsbury, an expert gunmaker, and when out of his time set up for himself at Northboro as the manufacturer of a firearm of his own invention, known as the Wesson Rifle. Rufus and Martin, the younger brothers, engaged in shoe manufacturing, to which business Daniel was urged by his father to devote himself under his brothers, but after trying it he found the business uncongenial and returned to the farm. Here he essayed some boyish Pistol making with the old flint lock of his father as a model. Wooden stocks, patiently whittled, and barrels molded from abandoned pewter vessels were deftly put together and fearlessly tested.

When Daniel was 18, in accordance with the custom of the times, he bargained with his father for his release for the three remaining years of his minority, for $150, which he paid out of his savings, and then went off to join his brother Edwin, the gunmaker. After he had completed his apprenticeship he worked as a journeyman for his brother, first at Northboro, then at Hartford, Conn., being a partner and superintendent of the shop at the latter place.

Upon the death of his brother Edwin in 1850 Mr. Wesson formed a partnership with Thomas Warner, a skillful master armorer in Worcester, Mr. Warner retiring from business about two years later. Mr. Wesson then joined his brother Frank, who manufactured Guns at Grafton, devoting himself to the making of Single Barrel Target Pistols. Thus he acquired a practical mastery of the armorer's craft and developed his inventive powers by constant experiment and experience.

About this time a Mr. Leonard, an educated man with both theories and capital, made a stir with an improvement in firearms, organizing the Leonard Pistol Mfg. Company at Charlestown, Mass., where Mr. Wesson was made superintendent, but the inventions were erratic and not practical. Changes followed, which released Mr. Wesson, then employed by Allen & Luther, who sought his assistance in turning out Gun Barrels. While with the firm he became acquainted with his subsequent partner, Horace Smith. Laboring during the day, Mr. Wesson devoted a large part of his evening to thought and study, which finally culminated in a cartridge that rendered percussion caps a superfluity. About this time Courtlandt Palmer, a rich New York man, came forward with an improved bullet, upon which Mr. Wesson improved.

It was in working out this plan that Mr. Wesson became associated with Horace Smith, with whom, in 1852, he formed a partnership and established a factory at Norwich, Conn. It was here, it is said, that the two men worked out the principles of what is now the Winchester Rifle. They made this Rifle for a time at Norwich, and later applied a similar principle to Pistols and other small arms. Eventually they disposed of their patents to the Volcanic Arms Company. Mr. Wesson was made superintendent of the Volcanic Arms Company, to which the Winchester Repeating Arms Company has since succeeded, and under its auspices the Smith & Wesson Cartridge, the first self-primed metallic one that had proved practical, was manufactured and used in the Spencer rifles during the Civil War.

Experimenting and testing incessantly, Mr. Wesson at length succeeded in perfecting a Revolver the peculiarity and merit of which lay in the fact that the chambers ran entirely through the cylinder. The basic patents for this important feature in Revolver manufacture, as well as some others, were issued on March 13 and April 3, 1855 to Rollin White, by whom they were transferred to what about this time became the firm of Smith & Wesson. The firm engaged premises in Springfield, Mass., in 1857, and with 25 men began operations. In 1860, being successful, they built a much larger factory, where, owing to the demand occasioned by the Civil War, they came to employ 600 men. In 1870 they were given a contract to furnish the Russian Government with 200,000 of their Revolvers.

In 1874 Mr. Smith retired, Mr. Wesson buying his interest, no change being made in the style of the firm. Since that time the business has been largely increased. Numerous improvements have been developed, including what is now known as the "Hammerless Safety Revolver," so well known everywhere. Two of Mr. Wesson's sons were associated with Mr. Wesson in the business—Walter H., taken in in 1883, and Joseph H., who became identified as a member in 1887.

While Mr. Wesson's attention was chiefly concentrated on his own business, he gave some time to developing other enterprises, being at one time president of the Cheney-Bigelow Wire Works, and one of the founders of the First National Bank of Springfield. His pronounced views on temperance caused him to erect two massive drinking fountains in Springfield, and so far as possible he counseled temperance among his employees. His independence of character made him an outspoken foe of sham and pretense in social, business or religious life. His Springfield residence is one of the finest in New England. Mr. Wesson gave large sums of money to benevolent objects, including $350,000 for the Wesson Memorial Hospital, just completed, and $400,000 for a maternity hospital, on which work has begun, the endowments of which by him, it is understood, will amount to $1,100,000.

The Hardware business of Bosworth & Aspinwall, Providence, R. I., has been purchased by Aspinwall Hardware Company, of which C. W. Aspinwall is president and treasurer; H. P. Brownell, vice president, and Fred Kempf, secretary. The company will continue at the old stand until about September 1, when it will move into a new store.

Trade in Japan.

We are in receipt of the following interesting advices in regard to trade in Japan from John L. Sardy of John L. Sardy & Co., Snow Hill, London, E. C., England, who is now making a business trip around the world:

BUSINESS in Japan and the East is not conducted as it is in the United States, where there are thousands of customers for a manufacturer to approach. It is true there are no end of Japanese dealers throughout the country, but most of them are very small, and it is quite out of the question for a manufacturer abroad to do direct business with them. The Japanese have their own commercial methods as well as their own code of morals, and both are decidedly different from ours.

To Do Business Safely in Japan

the manufacturer must have a reliable agent on the spot, one who thoroughly understands the crafty Jap, or at least so far as such an understanding is possible. To try to reach the dealers direct is folly. They are quite unable to buy in sufficient quantities to make a shipment, and furthermore would have to put up half cost with a banker before a letter of credit would be issued, and even if the dealer could do this he would be out of the money from three to four months before the goods were in his possession. He therefore prefers to place his orders through a manufacturer's resident agent, and as a matter of fact that is exactly what he does. It is not only a waste of time sending direct quotations to these dealers, but does a lot of harm besides, without leading to business. It frequently happens a dealer will write to, say, an American manufacturer whose address he has obtained, and in due course receives quotations which in nearly every case he should not have.

These Quotations, Instead of Bringing Trade

merely serve to antagonize legitimate importers or agents and the trouble taken is all in vain. Any one traveling in Japan for business finds it vastly more difficult than say in the United States, the chief trouble being that everything has to be transacted through a Banto or outside salesman, employed by all foreign or importing houses. These men are no doubt clever enough in their way, but it goes without saying that they cannot possibly exercise the same vim and knowledge in bringing a line of goods before a Japanese buyer that the actual representative of the manufacturer can. Another thing the manufacturer has to contend with is the well-known

Propensity of the Japanese to Copy

the work of others. They do this to perfection so far as outward appearance goes, but the quality is cheapened and almost always poor, but they do worse than this. Over and over again have they taken out Japanese patents on copied articles made abroad, thus not only utilizing the work of another, but actually preventing the manufacturer from selling his own product in Japanese territory.

The Crafty Jap.

Not long ago an American came to Japan with an ingenious article he desired to introduce. He left the model with a Japanese firm for a few days, and upon returning for it was informed the members of the firm were out. He said, however, he required the model, and was shown into the room where he had left it. Fancy his surprise when he saw side by side with his own model an exact copy. He took both away, and wrote an indignant letter, expressing his opinion of such conduct and congratulating himself that he had frustrated their plans by taking away the copy. His gratification on that score was shortlived, as the next post brought him a letter from the firm, stating they had taken the precaution of making two copies.

Wheelbarrow Philanthropy.

The Japanese coolies or laborers have their own way of working, and any one who tries to change them will save time by not attempting it. At one time an observant American, seeing the coolies carry earth and many other things in baskets, conceived the idea of importing Wheelbarrows. He managed to get rid of them at about the price of baskets, and the coolies instead of wheeling the Barrows carried them. It might interest our American labor unions to learn that these coolies work at least 12 hr. out of the 24, and are paid the munificent sum of 25 sen, or 12½ cents per day, yet they live and appear quite contented, have children and take care of them. The secret is that they all work, men, women and children. There are no idlers in a Japanese coolie's home.

Horse Drawn Vehicles Rare.

Aside from the ports like Yokohama and Kobe, horse drawn vehicles are scarcely used at all, hence there is very little sale for Saddlery Hardware or Wagons. A day spent in Osaka, the city of canals and the largest manufacturing town in Japan, population about 1,000,000, only disclosed one horse, and he was attached to a two-wheeled handcart by means of a rope. Where horses are used they are led by a rope and not driven, and when they are standing, instead of being tied to a post the practical Jap utilizes the leading rope by tying it about the animal's fore legs, hence there is no sale for Halters in the Land of the Rising Sun. Where horse drawn carts are used they are made locally and are very crude. Everything is handmade, including the Wheels.

American Agricultural Implements

are conspicuous by their absence, the single exception being in Hokkaido, the North Island of Japan. In this island an agricultural college was established by a Dr. Clarke, an American, and American Agricultural Implements are the only ones used there, and agriculture is carried on in a way according to American methods. It is a farming district and a breeding place for horses, hence they are cheap and used plentifully.

The Japanese Do Not Use Stoves

to warm their business establishments. Instead of the Stove is the hibachi, or wooden box, metal lined, on a stand placed in the center of the shop. Charcoal is the fuel used; this is smothered in the ashes of burned straw and smolders all day long. Besides giving warmth it is used for lighting cigarettes, which the entire population smoke most of the time, the article itself being of Japanese manufacture and protected by a duty of 250 per cent.

Japan's Imports Exceed the Exports,

the figures for the year 1905 being: Exports, yen, 321,533,610; imports, yen, 488,538,096. The yen is worth 50 cents United States currency. Out of these totals the value of metal and manufactured metal goods exported amounted to somewhat less than yen 19,000,000, and the imports of iron and steel and manufactured metal goods about yen 58,000,000. Refined copper makes up the bulk of the metal exportation, amounting in the year mentioned to about yen 16,000,000.

Sources of Supply.

Taking the single item of Nails to show the sources of supply for Hardware articles, Germany supplied nearly 50 per cent. more than the United States, the figures being a little less than yen 1,500,000, against about yen 1,000,000 from the United States. Belgium, France and England combined only supplied less than yen 70,000.

On October 1, 1906, a new customs tariff goes into effect, and on account of the high rates may restrict importation.

No Fear of Export Competition.

If any fear exists in the minds of American Hardware manufacturers concerning Japanese competition it is absolutely groundless, so far as the exportation of their manufactured product goes. The purely Japanese article is crude to a degree, and could not possibly find a market outside of its own country.

The retail Hardware trade is entirely in the hands of Japanese dealers, who obtain their supplies through American, English and German importing houses. The shops or stores are so small they are really tiny, but a

prosperous dealer will have really large stocks on hand in his warehouse or "go-down," as it is called. American Hand Wood Working Tools are not used at all in Japan. Saws, Planes, Chisels, &c., are quite different and suit the Japanese mechanic, who has been accustomed to them for ages.

American Machine Shop Tools

however, are being used more and more all the time, especially instruments of precision, which goes to show the Japanese are alive to making their work more accurate. The Japanese Government is making large improvements in their arsenals, public works, &c., and quantities of machinery will be required. A large part of this will be American, furnished through the resident agents of the manufacturer. It is said the appropriation will probably amount to yen 25,000,000. In June a Government contract was placed for 91 lathes, drills, grinders, &c., to supply the Maidzura Arsenal. Out of this total 80 of the machines specified and contracted for were American, the remaining 11 being German.

The Japanese Have Made Great Strides

in the manufacture of surgical instruments, the principal works being located in Tokyo and Osaka. They have copied perfectly the most approved patterns, and to all appearances the instruments are equal to the best made in Europe and America, but the quality is not there, and the Japanese doctors themselves are beginning to be aware of it.

Stores 10 x 15 Feet.

A careful survey of many Hardware shops in Japan failed to show any serious competition on their part in the smaller Hardware articles like Locks, Hinges, Wrenches, &c., goods of this character being American and German. Throughout Japan one cannot find a single Hardware establishment worthy of the name. For instance, in Tokyo, the capital and largest city, population nearly 2,000,000, there are hundreds of little Hardware places, about 10 or 12 ft. wide, and perhaps 15 ft. deep, all with open fronts, and as unlike a proper Hardware store as anything could be, but they all do business, never urge any one to buy, do not seem to worry, and very likely are more contented than some of our great Hardwaremen with their huge establishments.

DELIVERY RECORD FOR THE IMPLEMENT TRADE.

THE suggestion is made by E. W. Evenson, secretary of the Inland Empire Implement and Hardware Dealers' Association, that Manson's Delivery Record, which was described in a recent issue of *The Iron Age*, would be a great convenience to Implement merchants in keeping track of orders for extras during the harvest season. Such orders are very numerous just at this time and some of them are very likely to be overlooked or mislaid or lost, causing great inconvenience to customers, who of course are more than usually anxious for prompt service. The following incident may be imagined:

Farmer Jones calls up some morning by the rural telephone. He says:

"Can you get me No. R339 for a Deering Mower?"

"Yes."

"When can you deliver it?"

"Tuesday morning."

"All right; get it."

The order is then written on the first convenient slip, which gets mixed up with other papers and is not attended to. Tuesday morning Farmer Jones waits in vain for his part and finally calls up in a rage. Explanations don't go, sharp words pass, and your competitor has a new customer.

The use of some comprehensive form such as Manson's Delivery Record, which may be obtained from the David Williams Company, 14 and 16 Park Place, New York, providing for following up all orders and transactions systematically, will effectively prevent occurrences of this kind.

C. A. Pinkham has purchased the business of T. M. Herman in Holly, Colo., and will handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods and Harness, besides doing plumbing.

AUSTRALIAN NOTES.

(FROM A SPECIAL CORRESPONDENT.)

MELBOURNE, July 3, 1906.

THE Hardware trade of late has been in a fairly active condition, and Australia, as a whole, has recently benefitted considerably by seasonable rains which have come at the right time and justify traders in a feeling of confidence regarding the future. The building trade especially has been noticeably good both in the commercial centers and the country districts. Firms now are busily engaged in stock taking and balancing, and the general impression seems to be that the half year just closed will turn out to have been a very satisfactory one. Machine Tools, mining materials, and engineers' requirements have been in pretty fair demand. Implement makers are now having their off season, and mostly manufacturing for show purposes in the spring.

The New Zealand International Exhibition, to be opened at Christchurch, New Zealand, November next, bids fair to be a commercial success. The statistics of this Colony show steady growth from year to year, and it is perhaps the most prosperous portion of Australasia at present.

New trading ventures are springing up on every hand throughout Australia, and are perhaps the best guarantee that can be given at present of increasing prosperity.

The rabbit problem is being tackled in a thorough manner by the various Australian governments. The New South Wales Government has just closed a contract for 4000 miles of rabbit proof netting with the Association of British Netting Manufacturers, who are supplying 3000 miles of 42 x 1½ x 18 Netting at £25 6d. per mile, and a thousand miles of 36 x 1¼ x 18 at £21 12s. 10d. per mile delivered in Sydney. The Victorian Government is following in similar lines by deciding to advance £100,000 to landholders for the purchase of rabbit proof Netting.

Melbourne has just got its first Electric Tramway running between the two suburbs of St. Kilda and Brighton. Fifteen years ago the Melbourne Cable Tramway Service was justly regarded as the finest tram service in the world. Now, as regards speed, it is getting to be about the slowest. The Tramway Company has the sole right to the streets for the next 10 years, and so far as can be seen at present the City of Melbourne, which ranks pretty high among the cities of the British Empire, is going to continue having its slow cable service inflicted upon it, while small country towns enjoy rapid electric transit.

Newcastle, New South Wales, is about to adopt a scheme for the improvement of its harbor service. The harbor is naturally a small one, and generally shows the biggest collection of ships of all nationalities to be found anywhere in the world outside such ports as Liverpool, London or New York. Newcastle exports about 3,500,000 tons of coal per annum, and the output is increasing year by year.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM BACKUS & MORRIS, who have opened a store in Portland, Ore., and will conduct business under the name of "The Hardware Shop," making fine Fishing Tackle a specialty. They will also carry a stock of Hardware, Tools, Cutlery and Sporting Goods.

FROM B. R. GIBBONS HARDWARE COMPANY, which has opened a new Hardware, Implement, Vehicle and Harness store at Fowler, Colo.

FROM R. C. GORMAN, whose Hardware store at Kirklin, Ind., was recently destroyed by fire. His new building will be completed in about ninety days.

HARDWARE CONVENTION AT WINNIPEG.

THE semiannual convention of the Retail Hardware and Stove Dealers' Association of Western Canada, held in Winnipeg, Man., on July 25, was an important gathering in many respects. Organized just two years ago the association has made remarkable progress, over 300 of the 400 dealers in the vast territory comprising the three provinces of Manitoba, Saskatchewan and Alberta being now enrolled in the organization. Few of the associations in the United States can show so satisfactory a membership roll, particularly when it is remembered that the annual fee charged is $10 and Canadian laws have so far prevented a mutual Hardware insurance company from being formed.

So strong has the association become that the officers feel that they are now safe in grappling with trade evils, which have been allowed to go uncorrected up to the present time. The sale of goods to consumers by both manufacturers and jobbers has gone on to a very great extent in all parts of Canada, but most of the western Canada jobbers must be given credit for trying to do a legitimate trade. One American jobbing house, however, has ignored all advances made, and has practically defied the retailers' association by openly avowing its intention to sell to any one in the trade or outside of it.

Considering that the convention was held at a date when most Hardware merchants in the wheat country are extremely busy the attendance was very satisfactory. President A. J. Falconer, Deloraine, Man., in his opening address referred to retailers' relations with the jobbers as outlined above, and suggested as a possible remedy the establishment of a buyers' exchange, the retailers investing $300,000 to $400,000 in a co-operative jobbing enterprise. No action was taken in the matter, however, the proposition not being given any serious consideration.

Secretary's Report.

The secretary, J. E. McRobie, Winnipeg, reported in part as follows:

I take pleasure in presenting to you my report of the work done since the meeting last February. As shown in the financial report the membership at that time was 279; since then we have added 56 new members, making a total of 335 which have been enlisted to date. From this, however, we have to deduct 21, who have either sold out or retired from business, leaving us with a live membership to-day of 314, made up as follows: Manitoba, 158; Saskatchewan, 102, and Alberta, 54.

This I think is a very satisfactory showing when it is taken into consideration that we have only a possible 400, or a little over, legitimate Hardware dealers to depend on for our membership.

Regarding the workings of the association I have to report success in some cases, failure in others. I have visited a number of districts and have had some very good meetings; others, I regret to say, I have spent time and money on with no results, owing to the nonattendance of dealers who had ample notice of such meetings.

I am satisfied, however, that our association is progressing as rapidly as can be expected.

THE ASSOCIATION NOW EXTENDS

from Winnipeg to Edmonton, north to Prince Albert and south to the boundary. This is a very large territory, which takes very considerable time and expense to cover. I expect, however, to have this accomplished before your next meeting in February, and have the distant towns formed into strong local districts, calling them together at a central point during the bonspiels and have them fixed up in good shape for the starting out of the spring trade.

RELATIONS WITH JOBBERS.

The relationship between the jobbers and the members of this association, with one exception, has been much improved during the past few months. In each case, with one exception, when I had occasion to approach them I have been received with every courtesy and the matter in question either satisfactorily explained or the possibility of its recurrence eliminated. This should be a matter of congratulation to you all.

CREDIT COLLECTION FORMS.

A feature which has been introduced for your benefit, and which it is to be regretted a greater number have not taken advantage of, is the credit collection forms, issued free of charge. I have received testimonials from a great number who have used them, stating that they alone are worth many times the fee charged, as they had been the means of collecting debts which had been given up as down and out.

A Plea for a National Organization.

Credentials having been received from Weston Wrigley, as a fraternal delegate representing the Ontario Retail Hardware and Stove Dealers' Association, the privileges of the floor were extended to the delegate, who reported that although only three months old the Ontario Association had already about 150 members enrolled, in spite of bitter opposition from the Retail Merchants' Association officials, who seemed to think the Hardware dealers had no right to organize an association of their own. Mr. Wrigley suggested that the Ontario and western Canada associations unite in forming a national organization. Winnipeg jobbers were selling to consumers in Ontario, and it was said Toronto jobbers sold to persons outside the trade in Manitoba. By working together the two associations could secure many advantages for each other.

Resolutions.

The following resolutions were adopted:

Resolved, That we take action to form a Dominion Retail Hardware Association, and that the secretary be instructed to take the matter up with the secretary of the Ontario Retail Hardware and Stove Dealers' Association;

Resolved, That it is the opinion of the Western Retail Hardware and Stove Dealers' Association that the time has arrived when the field of distribution of the two classes, the wholesalers and the retailers, must be defined and each take their own and their exclusive place in the distribution of merchandise in the Hardware line;

Resolved, That it is the opinion of the association that a uniform lien law should exist in Manitoba, Saskatchewan and Alberta, and that as the lien laws now existing in these provinces are unsatisfactory, this association should co-operate with others desirous of having necessary amendment made;

Resolved, That as we find it a great inconvenience and loss to have our help interfered with by travelers and jobbers, that in the opinion of this meeting the travelers and jobbers should not make any attempt to induce employees to leave their employers, and that a copy of this resolution be forwarded to the travelers and jobbers of Winnipeg;

Resolved, That the example of the dealers at Deloraine in refusing to grant credit to farmers between the months of November and April be adopted by the members of the association generally.

Resolved, That in the opinion of the retail Hardware trade of the Canadian West much good can be accomplished by the co-operation of the three interests, the manufacturers, the wholesalers and the retailers, and that we believe that the present criminal code, which prohibits these three classes from entering into any fair agreement between one another, and which allows the laboring classes and their employers to enter into agreement, is unfair, and that we pledge ourselves to do all in our power to assist all kindred associations in having the present criminal law amended, and that this resolution be referred to the Western board, to work in conjunction with the Dominion board in trying to secure the necessary change.

Before closing its business the convention passed strong resolutions thanking the Canadian trade newspapers for their support and thanking the young Ontario Association for its enterprise in sending its secretary to represent it at the Winnipeg convention. A committee was also appointed to draft a plan of national organization for submission to the convention of the Ontario Association, which is to meet in Toronto on September 4 and 5, next.

W. A. IVES MFG. COMPANY.

W. A. IVES MFG. COMPANY, Wallingford, Conn., manufacturer of Hand Boring Tools, Ives Augers and Bits, Bit Braces, Tap Borers, &c., has established an office at 299 Broadway, New York. Beginning August 1, all goods will be charged from this office and all correspondence likewise handled from this address, the books and records of the company having been transferred to New York. The company requests that hereafter all communications, including orders and remittances, be sent to the New York office. This headquarters will be in charge of J. E. Watson, treasurer of the company, who is well known in the trade from his long connection with the export house of Hammacher, Delius & Co., New York and Hamburg, Germany.

Bremfoeder Hardware & Iron Company, Cincinnati, Ohio, has been incorporated with a capital stock of $30,000 by Joseph Willy, Robert Ramsey, G. P. Stimson, W. D. Breed and S. Hickenlooper.

ABUSE OF THE TERMS "2 OFF 10 DAYS" AND A SUGGESTED REMEDY.

BY WILLIS L. BROWNELL.

THESE terms quoted on 30-day sales mean that the seller offers the purchaser a discount of 2 per cent. for a prepayment of 20 days; or, in other words, 36 per cent. per annum for the use of money. Taken as an independent proposition, it would seem ruinous for a business house to pay such a rate; yet, under the terms "2 off 10 days," and present practice, thousands of business men are paying 48, 60 and even 72 per cent. per annum for money, because of the abuse of the terms. When they allow 2 per cent. discount for payments in 15 days they pay 48 per cent., and when they allow it for payment in 20 days they pay 72 per cent. When the rule of "2 off 10 days"

Was First Instituted,

it was not considered that it really meant paying the rate of 36 per cent. per annum for money, but simply that for payment in 10 days the seller was willing to reduce his profit somewhat. If, on a cost of $75 he sold at $100, his gross profit was 33 1-3 per cent.; if he allowed 2 per cent. discount on selling price, his profit was reduced to 30 2-3 per cent.—a reduction of profit equal to 2 per cent. on the selling price, or 2 2-3 per cent. on the cost.

Again, with the institution of a 2 per cent. discount many changed their price-lists, so that the allowance of 2 per cent. discount did not reduce profit below the old standard, whereas, on sales to customers who did not discount the profit was increased.

Thus, from the seller's standpoint the allowance of 2 per cent. 10 days was not a loss but a gain. Allowing that, say, one-fourth the amount of sales were discounted, on these the seller made the same profit as of old; and, on the remaining three-fourths he made more profit than of old. If the seller had not changed price-list, presuming that not over one-fourth in amount of his sales would be discounted, the institution of the 2 per cent. discount would in effect simply have reduced his profit equal to one-half of 1 per cent. on selling price, or two-thirds of 1 per cent. on cost.

As to the purchaser, when the 2 per cent. discount was first instituted it was not considered that he, when discounting purchases, was putting out money at 36 per cent. per annum, but simply buying goods 2 per cent. less than before.

Thus we have granted that when the rule of "2 off 10 days" was first instituted, a general idea prevailed that its effect on the seller was simply a slight reduction of profit and to the purchaser a reduction of 2 per cent. in cost. What followed?

With the Passing of Time

came competition, prices were cut repeatedly, cost not reduced proportionately, margin of profit became less and less; still, the rule "2 off 10 days" prevailed; but not as at first did purchasers make payment in 10 days, but took 12, 15 or 20 under one pretense or another, claiming 2 per cent. discount just the same. It became generally recognized that "2 off 10 days" was for cash discount; that it meant paying for the use of money for a given time; that it meant a rate of 36 per cent. per annum. Cash discount was not considered a direct charge against sales—a reduction of profit on sales—but payment for the use of money, and an account called "discount on sales" was opened; also an account styled "discount on purchases."

Thus it was finally generally recognized that "2 off 10 days" meant a price paid for the use of money on the one hand and a price received for the use of money on the other. Many a business man boasted that on discounting purchases he made as much as and often more than he did on his sales. Of late the terms "2 off 10 days" have become meaningless because of the general disregard of the time limit.

Purchasers Loth to Lose the Discount,

though not making payment in 10 days, but in many cases taking 15 or 20 days and even longer, when remitting, deduct 2 per cent. In such cases seldom does an explanation accompany the remittance, but if the tender is rejected the purchaser offers various excuses, such as, "delay was owing to an oversight," "we paid as soon as goods were received, we object to paying before"; "our system does not permit of having bills vouchered for payment in 10 days," &c.

It hardly seems necessary to say that none of these and many other excuses offered justify the disregard of the time limit agreed upon at the time of purchase. That is the time when the purchaser should take exception to the time limit, if not acceptable.

The practice of disregard of time and arbitrary exaction of discount has been encouraged by sellers who have deemed it "politic" to submit. The fallacies "for policy's sake," "in order to keep friendly with our customers and hold their trade," "others do it, we must," &c., blind many not only to the violation of the moral principle involved, but to the extent and force of the exaction to which they submit.

Would a Purchaser Deem It "Politic"

to pay a supplier for more goods than he furnished? The old saying has it that "a bargain is a bargain." Why not "terms terms?" And why not live up to the true meaning? Of what use are terms if not recognized?

The writer believes that if serious and just consideration is given the matter, all fair minded business men will, on the one hand, cease to ask payment for the use of money beyond the time period they give use of it; and, on the other hand, refuse to pay for the use of money for a longer period than they have the use of it.

How to Insure a Square Deal.

Why cannot the matter be taken in hand so as to insure a square deal? It can, either by discarding cash discount or by quoting same in such explicit terms and on such equitable and accommodating lines that any attempt at violation will stand out clearly as deliberate and premeditated exaction. For instance, stick to the "2 off 10 days" if you will—the rate of 36 per cent. per annum, but quote in this way:

Terms net 30 days. A discount of 1-10 of 1 per cent. per day will be allowed for the actual number of days prepayment is made.

Under this rule we secure 2½ off 5 days, 2 off 10 days, 1½ off 15 days, &c.

As under this rule the seller agrees to pay the purchaser for money for the exact time he has the use of it, the purchaser cannot reasonably ask more under the same ruling than he would not submit to the demand of a seller for payment for more goods than furnished.

Pro Rata Discount.

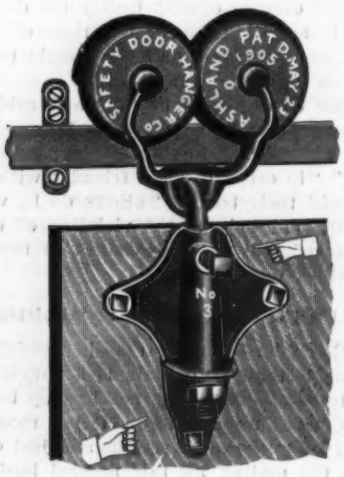
It should be noted that under the proposed terms, if for any reason it be inconvenient or undesirable for a purchaser to pay in 10 days, he may take 15 or 20, and still secure pro rata discount; whereas, under the terms "2 off 10 days" correctly interpreted, he would not be entitled to any discount after 10 days from date of invoice.

It is within the knowledge of the writer that a large manufacturing corporation recently adopted and put in effect the terms above noted, that the same have been generally accepted by its customers, and that experience thus far furnishes a preponderance of evidence in support of the equity of the terms.

THE GRIFFON CUTLERY COMPANY, 459-461 Broadway, New York, has issued an advertising hanger, 17 x 22 in. in size. In the center is a picture of a small boy whittling, entitled "His First Griffon," and surrounding that on a dark red background are cuts of Razors, Pocket Knives, Scissors, &c., bearing this well-known brand. The hanger is bright and attractive and substantially gotten up.

The Wizard Tandem Adjustable Hanger.

The Safety Door Hanger Company, Ashland, Ohio, is offering the tandem adjustable hanger, shown herewith, which has in addition both lateral and vertical adjustments. All difficulty of doors binding against the building is overcome by turning the set screw, and a door which drags at the bottom may be released by turning the hexagon nut. By means of the lateral adjustment the door may be placed as close to the building as desired, and



The Wizard Tandem Adjustable Hanger.

both adjustments are easily accessible in case a roof is placed over the hangers and track. The hanger is guaranteed to run easy on account of the two sets of steel roller bearings, and the weight divided on two wheels instead of one, is designed to make the rail less liable to buckle. The frame and door plate are made of best grade malleable iron and the entire construction of the hanger is guaranteed by the maker to be stronger than the ordinary flexible design.

Perfection Safety Razor Guard.

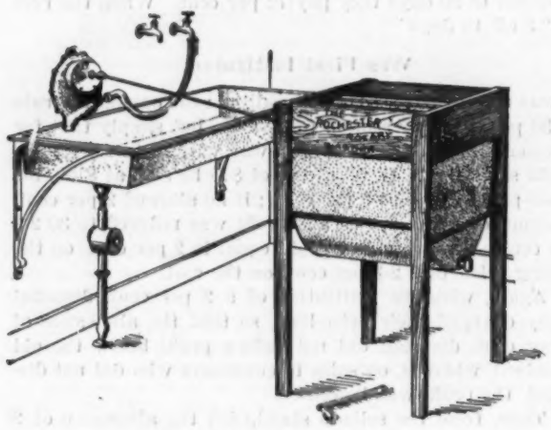
John Pletscher & Son, Baltimore, Md., whose sole selling agent for the United States is the Sperry & Alexander Company, 300 Broadway, have just put on the market the Perfection safety razor guard here illustrated.

Perfection Safety Razor Guard.

This guard is universal for razor blades from ½ to ¾ in., and once adjusted to a razor can be instantly slipped off and on for stropping, cleaning, &c., thus converting any regular razor into a safety razor instantaneously. The guard can be put on either side of the blade, for either right or left shaving. It is 3 in. long over all and has adjustments for both thickness of back and width of blade. In adjusting it is only necessary to unlock the levers on the comb by turning them toward each other, then slide the comb down so as to extend about 1-16 in. beyond edge of the blade, when the levers should be turned back tight, which locks the comb in position and a safety razor is ready for use. The guards are polished and nickeled, put on display cards and listed at $2 per dozen, from which there is a trade discount to merchants.

The Rochester Rotary Washing Machine.

The accompanying cut shows a rotary washing machine with motor attached, having a ⅛-in. nozzle for water, which will run the washer filled with clothes on from 30 to 35 lb. pressure. The same washer can be used with hand power. The washer is 36 in. high, 28 in. long and 22½ in. in diameter. The diameter of the cylinder is 20 in. The iron work is galvanized and the entire machine is securely and substantially constructed. The articles to be washed are placed in a wooden cylinder and do not come in contact with rustable metal. The cir-



The Rochester Rotary Washing Machine.

cumference of the cylinder is composed of alternate wooden slats and perforated zinc, to allow the free access of hot soap suds in which the cylinder revolves. The cylinder holds from 40 to 60 pieces, and as it revolves the clothes are prevented from packing by two wooden wings placed on either side of the cylinder, at an angle so as to throw the clothes on the opposite side. This motion is designed to open the clothes and to subject every article to the suction of the water produced by the revolutions of the cylinder. With the motor attachment, it is stated that a basket of clothes can be washed in 15 min. at a cost of 1 cent. The machine is manufactured by the Rochester Rotary Washer Company, Rochester, N. Y.

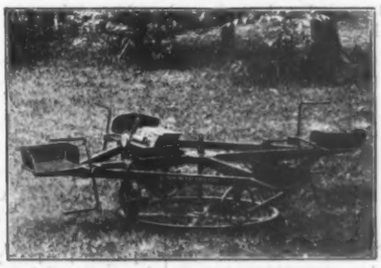
Cutlery Pencil.

The Sperry & Alexander Company, 300 Broadway, New York, is offering the cutlery pencil here shown two-thirds size. This pencil consists of a peculiar graphite marking substance ⅛ in. in diameter in a rolled paper casing $^{5}/_{16}$ in. in diameter, the graphite filling being uncovered as it is used up by cutting a circle around the outer layer of paper and removing a spiral strip, as has long been done with the common lead pencil similarly made. In this instance, however, it is the composition of the graphite that enables the user to mark cutlery, china, glass, porcelain, tinware, enameled ware or kindred smooth surfaces easily and yet without danger of injuring the sale of an article. Its adhesive quality is sufficient for the purpose, and at the same time a little brisk rubbing will entirely remove it.

Pencil for Marking Cutlery, Glass, &c.

The Health Merry-Go-Round.

For the amusement of children and at the same time affording healthful exercise the merry-go-round, herewith illustrated, has been devised and is being placed on the market by the Health Merry-Go-Round Company, Quincy, Ill. It is operated by children in the seats, who by means of hand and foot levers propel the contrivance by nearly the same movements as are used in rowing a

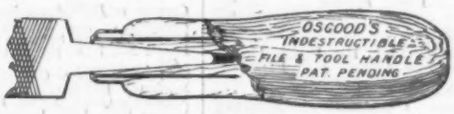


The Health Merry-Go-Round.

boat, thus bringing into play all the muscles of arms, legs, back and body. The exercise, however, is not severe and is obscured by the pleasure derived by the child. A detachable organ, fitted with pulley and belt, plays while the machine is in motion. Each seat is 5 ft. from center, making the machine 10 ft. across. It is strongly built and the manufacturer states will last for years.

Osgood's Indestructible File and Tool Handles.

J. L. Osgood, Erie County Bank Building, Buffalo, N. Y., is putting on the market the file and tool handle



Osgood's Indestructible File and Tool Handles.

shown herewith. It has a steel ferrule forced into the handle the full length of the file or tool shank, which also locks the outer short ferrule on the handle. The construction is such that no amount of shrinkage of the handle will allow the ferrule to become loose and drop off. The inner steel tube is designed to take all the pressure off the wedging file or tool shank, making it impossible to split the handle by driving in the tool. The handles are made of soft wood, with a view to the comfort of the workman. The manufacturer states that one handle will ordinarily outlast from 20 to 30 common wooden handles, resulting in the reduction of cost in handle bills. The handles are made in six sizes, for 4 to 20 in. files.

The Jackson Instantaneous Wrenches.

The wrenches represented herewith are manufactured by the Union Tool Company, 147 Milk street, Boston, Mass., and are designed to operate with one hand.

Fig. 1.—Jackson Instantaneous Wrench, 14-In.

The jaws of the wrench in Fig. 1 are made of drop forged steel, with the handle of one solid piece, affording great strength. Owing to the instantaneous action of the tool it can be adjusted and relieved quickly by the operation of a lever movement. It is adapted to the use of

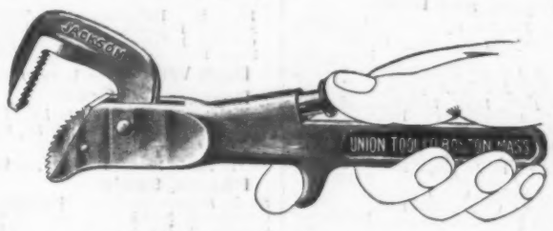


Fig. 2.—Jackson Instantaneous Wrench, 8-In.

plumbers, steam fitters, &c. The 8-in. wrench, Fig. 2, is operated by pressing a push button on the top of the handle and is particularly adapted to the use of electricians, gas fitters, &c.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal.
Linseed, City, raw	.38 @.39
City, Boiled	.36 @.38
State and Western, raw	.37 @.38
Raw Calcutta Seed	.68 @..
Lard, Extra Prime, Winter	.70 @.71
Extra No. 1	.52 @.53
No. 1	.40 @.42
Cotton-seed, Crude, f.o.b. mills	@..
Summer Yellow, Prime	.38 @.38¼
Summer Yellow, off grades	@..
Sperm, Crude	.53 @..
Natural Spring	@..
Bleached Spring	@..
Natural Winter	.63 @.65
Bleached Winter	.66 @.67
Bleached Winter, Extra	.68 @.69
Tallow, Prime	.51 @.53
Whale, Crude	.32 @.33
Natural Winter	.43 @.44
Bleached Winter	.45 @.46
Extra Bleached Winter	.47 @.48
Menhaden, Brown, Strained	.26 @.29
Light, Strained	.27 @.30
Bleached, Winter	@..
Extra Bleached, Winter	@..
Southern	@..
Cocoanut, Ceylon	℔ lb .. @ 7½
Cochin	℔ lb 8¼@ 8½
Cod, Domestic, Prime	.30 @.33
Newfoundland	.35 @.37
Red, Elaine	.37 @.42
Red, Saponified	℔ lb 4¾@ 5
Olive, Italian, bbls	.52 @.56
Neatsfoot, Prime	.48 @.49
Palm, Logos	℔ lb 6⅛@..

Mineral Oils—

Black, 29 gravity, 25@30 cold test	10½@11½ gal.
29 gravity, 15 cold test	11½@12½
Summer	10½@11½
Cylinder, light filtered	.18 @.19
Dark filtered	.16 @.17
Paraffine, 903-907 gravity	13¾@14
903 gravity	12½@13
883 gravity	10¼@10¾
Red	12½@14

In small lots ¼¢ advance.

Miscellaneous—

Barytes:		
White, Foreign	℔ ton	$17.50@19.00
Amer. floated	℔ ton	19.00@.....
Off color, No. 2	℔ ton	13.50@15.00
Chalk, in bulk	℔ ton	3.00@3.25
In bbls	℔ 100 lb	....@ .35
China Clay, English	℔ ton	11.00@17.00
Cobalt, Oxide	℔ 100 lb	2.50@ 2.60
Whiting, Common	℔ 100 lb	.43@ .48
Gilders	℔ 100 lb	.50@ .55
Ex. Gilders	℔ 100 lb	.55@ .60

Putty, Commercial—℔ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.30 @1.40
In 1 lb to 5 lb cans	2.65 @2.90
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—℔ gal.

In Oil bbls	59½@60
In machine bbls	.60 @60½

Glue—

	℔ lb
Cabinet	.11 @15
Common Bone	.7 @ 9
Extra White	.18 @24
Foot Stock, White	.11 @14
Foot Stock, Brown	.8 @11
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.9 @12
Medium White	.14 @17

Gum Shellac—

	℔ lb
Bleached Commercial	.44 @47
Bone Dried	.55 @57
Button	.40 @50
Diamond I	.54 @55
Fine Orange	.50 @52
A. C. Garnet	@40
D. C	.58 @60
Octagon B	@52
T. N	.47 @49
V. S. O	@55

Colors in Oil—

	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	9½@ 9¾
Lead, American white, in Oil:	
Lots of 500 lb or over	.. @ 7¼
Lots less than 500 lb	.. @ 7¾
In Barrels	.. @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	.. @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	.. @ 1
Lead, White, in oil, 1 to 5 lb asst'ed tins, add to keg price	.. @ 1¼

Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	℔ lb
Lead, White, Dry, in bbls	.. @ 6¾
Zinc, American, dry	5¾@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10½
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	10½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12¾@13¼
Lots of less than 1 ton	12⅝@13⅜
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾@11⅞
Lots of less than 1 ton	11⅝@12⅛

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon	.5 @10
Black Drop, American	.4 @ 6
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, Com	4½@ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.29 @32
Blue, Prussian	.27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.20
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	.. @ 7¼
Lots less than 500 lb	.. @ 7¾
Litharge, American, bbls	.. @ 7¼
Ocher, American	℔ ton $8.50@16.00
American Golden	2½@ 3½
French	1¼@ 2½
Foreign Golden	3 @ 4
Orange Mineral, English	.10 @12
French	10¾@12
German	8½@10
American	8½@ 8¾
Red, Indian, English	4½@ 8½
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Italian, Raw, Powdered	3 @ 6½
American, Raw	1¼@ 2
American Burnt and Pow	1¼@ 2
Talc, French	℔ ton $17.00@25.00
American	℔ ton 17.00@25.00
Terra Alba, French	℔ 100 lb 90 @1.00
English	℔ 100 lb 80 @1.00
American	℔ 100 lb, No. 1, 75 @80
American	℔ 100 lb, No. 2, 60 @65
Umber, T'key, Bnt. & Pow	2¾@ 3¼
Turkey, Raw and Powdered	2¼@ 3¼
Burnt, American	1¼@ 2
Raw, American	1¼@ 2
Yellow Chrome	.12 @14
Vermilion, American Lead	.10 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	.. @..
English, Import	.65 @..
Chinese	.. $0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ₱ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₱ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....₱ lb 9@9¼ ¢

Imported—

Peter Wright & Sons, ₱ lb, 84 to 340 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Patn., reg. finish.....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 19 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&2&7½%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....30%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $.26....50&10%
Clark's Pattern, No. 1, ₱ doz. $26; No. 2, $18.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$9.75@5.00
Second Quality.....$9.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 6¾@9¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&10%
Straight Balances.....40@50%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3¼¢

Towel

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ₱ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..₱ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....₱ gro. $7.80
No. 2 Buffalo.....₱ gro. $9.00
No. 3 Perfection Dust.....₱ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 1, Jap'd, $1.20; No. 1, Tin'd, $1.50; No. B, Jap'd, $2.00; No. 2, Tin'd, $2.25.
Lyon, Jap'd, per doz., No. 2, $1.25; No. 3, $1.50.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (R. M. Co.)..₱ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@60&10&5%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$4.75*	*5.70*	*6.65*	*7.60*	*8.85*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz..	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells—Cow—

Ordinary goods.....70@70&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.60&10%
White Metal.....60%
Nickel Plated.....50&10&60%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10@60%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son's 1906 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash—See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ × 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle, $3.00 list May 21, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅜ x 4 and smaller 75@—%
Machine, larger and longer.. 65&5@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch.....3 4 5 6 8
Per doz.$0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz.....$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz.....$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz.....$0.75 .95 1.25
Wrought Barrel Japd.80@80&10%
Barrel Bronzed.....50@50&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square ...66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—

Plow .....65&10@—%
Stove .....87½&10@—%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....75%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz....	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*			*2½*
Per doz	*$6.65*			*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each...25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.: Nos. 240 to 460, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

	Quart.....	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....₱ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, list, Sept., '96.15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Discount.
Reversible and Broad.75&5%
Light Reversible, Light Narrow .....75&10%
Loose Joint, Narrow, L'ht Inside Blind, etc.....75%
Back Flaps, Table, Chest. .....70&10%

Extra, 10&10@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, 5%; 1200, 33⅓%; 200, 300, 600, 900 .....40&10%
Hendryx Bronze: Series 700, 900.... 40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4¢@4¼¢
Sharp, 1 prong...per lb., 3½@4¾¢
Burke's Blunt, 4@4¼¢; Sharp, 4½@4¾¢

Gautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Buffalo Family Oil Cans:

Caps, Percussion—
Eley's E. B......52@55¢
G. D......*per M* 34@35¢
F. L......*per M* 40@42¢
G. E......*per M* 48@50¢
Musket.....*per M* 62@63¢

Primers—
Berdan Primers, $2 per M...80%
B. L. Caps (Sturtevant Shells)
$2 per M.....20%
All other primers per M.....$1.60

Cartridges—
Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball.....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—
Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$3.70	5.00	4.95	4.20	4.05	3.95	3.90

⅝	¾	⅞ to 1	1⅛ to 1¼ inch.
$3.85	3.70	3.65	3.80

German Coil.....60&10@60&10@70%

Halter—
Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Covert Mfg. Co.
Halter.....35&5%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6¼—6-3, Str'ght, with ring.$25.00
6½—6-2, Str'ght, with ring.$26.00
6½—8-2, Str'ght, with ring.$30.00
6½—10-2, Str'ght, with ring.$35.00
NOTE.—Add 2c per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 5, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c......60&10%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....60&10%
Safety Chain.....70&10%
Gal. Pump Chain.....lb. 4@11½%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
Am. Dog Leads and Kennel Chains.....40@40&5%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—
Oneida Community:
Copper Chain, 60&5%; Steel Chain, 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)
Carpenters' Blue....gro., 40@—¢
Carpenters' Red....gro., 35@—¢
Carpenters' White...gro., 30@—¢
See also Crayons.

Checks, Door—
Bardsley's.....45%
Pullman, per gro.....$54.00
Russwin.....40%

Chests, Tool—
American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....60%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—
Socket Framing and Firmer
Standard List...75&10@75&10&5%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....60%
Socket Framing No. 15.....60%
Swan's.....75%
L. & I. J. White.....30@30&5%
L. & I. J. White, Tanged.....25&5%

Tanged—
Tanged Firmers....33 1-3@40%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%

Cold—
lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary...9@10¢

Chucks—
Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....35%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks....40&10%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws.....40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat. 25%; Positive Drive.....33⅓%
Planer Chucks.....30%
Face Plate Jaws.....40&10%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 82 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..35%
Independent Iron, Nos. 18 and 318.40%
Independent Steel, No. 64.....30%
Union Czar Drill, Nos. 000, 101, 103.....35%
Universal 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 25, 30, 48 and 50.....40%
Steel Face Plate Jaws, Nos. 70 and 72.....35%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—
Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....40&10@50%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—
Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—
Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—
Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White.....30%

Clippers, Horse and Sheep—
Chicago Flexible Shaft Company:
'98 Chicago Horse, each....$8.75
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Horse, each.....$8.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
} 20%

Clips, Axle—
Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....70%
Compression Bibbs.....65&10%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—
Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—
Metal Stamping Co.....40%

Compasses, Dividers, &c.
Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double, 65%; Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....75%

Conductor Pipe,—
L. C. L. to Dealers:

Territory:	*Galvanized*	
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
60&30%	*60&2½%*	*40&10%*
Central:			
70%	*55&7½%*	*40&7½%*
Western and Southern:			
65&10%	*55&2½%*	*40&5%*
So. Western			
62½&7½%	*50&5%*	*40&2½%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each..	2	3	4	6	6
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4		6	8
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled, 25%; Agate Lined.25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—
Soldering Coppers, 8 lbs. to pair and heavier, 23@24¢; lighter than 8 lbs. to pair.....25@26¢

Cord— Sash—
Braided, Drab.....*lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Cable Laid Italian.....*lb., A, 18¢; B, 16¢*
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia.....lb...@11¢
Cable Laid Russia.....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@15¢
Anniston Cordage Co.: ℔ lb, solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ℔ doz., 50 ft.; Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ℔ lb, 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 6, 9 and .10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, per lb., Drab Cotton, 40¢; Italian Hemp, 40¢; Linen, 55¢; White Cotton or Spot....35 ¢
Massachusetts, White.....℔ lb 30 ¢
Massachusetts, Drab.....℔ lb 35 ¢
Phoenix, White, Nos. 8 to 12, 27¢; No. 7, 27½¢; No. 6, 28½¢.
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—
List July 10, 1906...85&10&10@—
Hendryx Standard Wire Picture Cord, old list, 85&10%

Cradles—
Grain.....40&12½%

Crayons—
White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber:
Red, Blue, Green.....℔ gro. $6.50
Black.....℔ gro. $4.00
See also Chalk.

Crooks, Shepherds'—
Fort Madison, per doz., Heavy, $7.00; Light.....$6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden.....50%

Cutlery, Table—
International Silver Company:
No. 12 M'd'm Knives, 1847..℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters— Glass—
H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American						
Nos.	1	2	3	4	8	8
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%
No. 202, $1.50						40&7½%

Dixon's.....℔ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$18.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ℔ doz. $24.00.....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....℔ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater.....℔ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..℔ gr. $18@$20
Slaw Cutters, 2 Knife..℔ gr. $22@$30

Tobacco—
All Iron, Cheap..*doz.* $4.25@$4.50
Enterprise.....25@30%
National, ℔ doz., No. 1, $21; No. 2 $18.....40%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger, per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Vaughan Pattern Post Hole Augers, ℔ doz., $6.25
Perfection Post Hole Diggers, ℔ doz.....$8.25
Split Handle Post Hole Diggers, ℔ doz. $7.25
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer.....$7.00
Never-Break Post Hole Diggers, ℔ doz., $24.00.....60%
Samson, ℔ doz. $34.00.....25%

Dividers—See *Compasses.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ℔ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—
Diamond Emery Wheel Dressers.....35%
Diamond Wheel Dresser Cutters.....35%

Drills and Drill Stocks—
Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@10&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills..33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's, 40%; Weston's..40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—
Bit Stock.....60&10&10@70%
Taper and Straight Shank..60&10@60&10&5%

Drivers, Screw—
Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., ℔.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....50&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles, 65%; No. 86, 75%; Victor, 55%; Defiance..70%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
80%	*70&5%*	*40&10%*
Central:			
75&10&7½%	*70%*	*40&7½%*
Western and Southern:			
70&20&7½%	*60&15&2½%*	*40&5%*
So. Western:			
70&20%	*65&2½%*	*40&2½%*

Terms,—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—
Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge.....60&10%
No. 26.....30%
No. 24.....25%
No. 22.....10%
Copper.....50%

Elbows, Stove Pipe—
Dover, one piece.....40%
Perfect Elbows (R. M. Co.).....40%

Emery, Turkish—

	¼ to 46:	*5½ to 220:*	*Flour.*
Kegs.....*lb.*	5 ¢	5¼¢	5¼¢
½ Kegs.....*lb.*	5¼¢	5¾¢	5¾¢
¼ Kegs.....*lb.*	5½¢	6 ¢	6 ¢
10-lb. cans, 10 in case....6½¢	7 ¢	8 ¢	
10-lb. cans, less than 10.....10 ¢	10 ¢	8 ¢	
Less quantity..10 ¢	10 ¢	8 ¢	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

Fasteners, Blind—See *Squeezers, Lemon.*

Zimmerman's ..... 50&10%
Walling's ..... 40&10%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined ..... 50@50&10%
Metallic Key, Leather Lined .. 60&10@70%
Red Cedar ..... 40&10@50%
Petroleum ..... 70&10@75%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mtl. Key. 50&10%
John Sommer's Duplex Metal Key.. 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined.. 50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined. 60%
John Sommer's O. K. Cork Lined... 50%
John Sommer's No Brand, Cedar.... 50%
John Sommer's Perfection, Cedar.... 40%
McKenna, Brass:
Burglar Proof, N. P. 25%
Improved, ¾ and ⅞ inch 25%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36. 40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@75&10@10&10%
Lower Grade ..... 75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz	$3.25	3.75	4.25	4.75

P., S. & W. Co. ..... 30&10@40%
Reading Hardware Co. 60%
Stowell's Giant Grindstone Hanger.. ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 50&10&10%; Light ..... 60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Header 66⅔%
Champion, Hay 66⅔%
Champion, Header 66⅔%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Bath ..... 60&20%
Kansas Header 66⅔%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped. 3.65
Waterproof Dbl. Taped. 4.40
Waterproof Tpl. Taped. 5.15
} Extra 10% often given.

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80&10%

Gauges—

Marking, Mortise, &c. 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Scholl's Patent ..... 50&10@50&10&10%
Door Hangers ..... 50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge 30%
Marking and Mortise 60%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire, P., S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 60@60&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush .. 25&10@50%
International Glue Co. (Martin's) .. 40%

Grease, Axle—

Common Grade .... *gro.* $4.50@6.00
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ₱ doz., 1 lb. $1.20; 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ₱ doz. ..... $2.00 } 33⅓
Pike Mower and Tool Grinder, each ..... $6.00 }

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&10@60&10&5%
Covert Mfg. Co.:
Web 45%
Jute Rope 45%
Sisal Rope 33⅓%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters. 45@50&5%
Niagara Cow Ties .... 45&5@50&10&5%

Hammers—Handled Hammers—

Heller's Machinists' ... 40&10@40&10&10%
Heller's Farriers ..... 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25 $1.50, $1.75 ..... 50%
Peck, Stow & Wilcox, Steel 50%
Payette R. Plumb:
Plumb, A. E. Nail ..... 33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand ..... 50&7½&5@50&10&7½&5%
Machinists' Hammers. 50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢...80&10%
3 to 5 lb., per lb. 40¢.....80&10%
Over 5 lb., per lb. 30¢...80&10&10%
Wilkinson's Smiths' ...lb. 9½@10¢

Handles—Agricultural Tool Handles

Axe, Pick, &c. ....60&10@60&10&5%
Hoe, Rake, &c. ..... 45@50%
Fork, Shovel, Spade, &c.:
Long Handles ..... 45@50%
D Handles ..... 50@50&5%

Cross-Cut Saw Handles—

Atkins' 40%
Champion ..... 45@45&10%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ... *gro.* $2.50@3.00
Brad Awl ..... *gro.* $1.65@1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; *Hickory* ..... $2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; *Hickory* ..... $1.45@1.60
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... *gro.* $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; *Not Varnished* ... 65@75¢
Plane Handles:
Jack, doz. 30¢; *Jack, Bolted.* 75¢
Fore, doz. 45¢; *Fore, Bolted.* 90¢
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle. ₱ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&10%
Roller Bearing 70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 70%
Roller Bearing, No. 11, $15.00. 70%
Roller Bearing, Ex. Hy., No. 22, $18.00 ..... 70%
Hinged Hangers, $16.00 .... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&5%
Hinged ..... net $6.40
Covered ..... 60&2%
Special ..... 70&5%
Lawrence Bros.:
Advance and Sterling ..... 60&10%
Cleveland and Peerless 75%
Clipper, No. 75 ..... 60%
Crown ..... 60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant ..... 60&5%
Hummer ..... 70&5%
New York ..... 60&10%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers ..... 60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track No. 3. $2.00
Ball B'r'g St'l Track No. 10. 50&10%
Roller B'r'g St'l Track No. 12. $2.15
Roller B'r'g St'l Track No. 13. $2.30
Roller B'r'g, Nos. 39, 41, 43, 70&10%
Hero, Adj. Track No. 19. 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22. 50&10%
Trolley B, D No. 17, $1.25; F. D. No. 120, $2.10; No. 121, $2.25; No. 150 ..... $2.35
Safety Underwriters F. D. No. 101 ..... 60%
Tandem No. 41, 2½ and 3 60&10%
Palace, Adjustable Track No. 132 ..... 50&10%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.00
Trolley B, D, No. 29 ..... 50&10%
Trolley B, D, No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43; 44, Sizes 1 and 2. 70&10%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60&10%
Hinged Tandem No. 48 ... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing 40%
Ajax Hinge Door 60%
Apex Parlor Door ..... 50&10&5%
Atlas, 60%; Freight Car Door, 60%
Baggage Car Door 50%
Climax Anti-Friction ..... 50&10%
Elevator 40%
Express 50%
Interstate ..... 60&10%
Lundy Parlor Door ..... 50&10%
Magic, 60%; Rex Hinge Door. 60%
Matchless ..... 60&10%
Nansen ..... 70&5%
Parlor Door, 50&10%; Railroad, 50&10%
Street Car Door 50%
Steel, Nos. 300, 404, 500 ... 50&10%
Underwriters' Fire Door 40%
Wild West Warehouse Door. 50%
Zenith for Wood Track ... 50&10%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle 70%
Climax Anti-Friction ..... 50&10%
Hylo Hinge, New Perfection, Pilot, Pilot Hinge 60%
Rider Wooster 65%
Western Pattern 70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing. 50&15&10&5%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.00; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $15.00; Garment Hanger Loops, Round Nickeled, per gro. $15.00
Victor Folding ..... ₱ gro. $9.60
Western, W. G. Co. ..... 70&10%

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp 50%
McKinney's Perfect Hasp, ₱ doz. 50%

Hatchets—

Regular list, first quality 50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 2E, $3.25; No. 1, $3.50 ..... 15%
Clark Coal, ₱ doz. $0.75 ..... 10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $1.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&10&5%
Acme, Lull & Porter ..... 75&10%
Queen City Reversible ..... 75&10%
Shepard's Noiseless, Nos. 60, 65, 95 ..... 75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75& 0&2%
1868, Old Pat'n, Nos. 1, 3 & 5 ..... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75&10&5%
Buffalo Gravity Lockir . Nos. 1, 3 & 5 ..... 75&10&5%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75. 75%
Steamboat Gravity Locking, No. 10. 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.85

New England:
With Latch ..... *doz.* ... @$2.00
Without Latch ... *doz.* ... @$1.60
Reversible Self-Closing:
With Latch ..... *doz.* ... @$1.75
Without Latch ... *doz.* ... @$1.35
Western:
With Latch ..... *doz.* $1.75
Without Latch ..... *doz.* $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 45%

Spring Hinges—

Holdback, Cast Iron ... $6.50@$7.00
Non-Holdback, Cast Iron $6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 45%
Bardsley's Patent Checking .. 15%
Bommer Bros.:
Bommer Ball Bearing Floor. 40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor. 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Ball Bearing Floor Hinge 40%
Ohio Detachable Screen Door Hinge ..... ₱ gr. $12.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting 45%
New Idea Floor 45%
Van Wagoner:
Ball Bearing 25%
No. 777 Sh't Steel Holdb'k. ₱ gro. pr. $9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 23, 1904:
Light Strap Hinges .. 65%
Heavy Strap Hinges .. 75%
Light T Hinges 60%
Heavy T Hinges 55%
Extra Hy T Hinges .. 70%
Hinge Hasps 45%
Cor. Heavy Strap ... 75%
Cor. Ex. Heavy T .. 70&10%
} Extra, 10&10@10&10%

Screw Hook and Strap. { *6 to 12 in.* ..lb. 3¾¢ ; *1¼ to 20 in.* ..lb. 3½¢ ; *22 to 36 in.* ..lb. 3¼¢ }

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch.....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
	Per doz.			
Inch	15	16	17	18
Galv. Open	$2.50	2.75	3.00	3.25
Jap. Open	$1.90	2.10	2.25	2.55
Galv. Funnel	$3.00	3.30	3.60	3.90
Jap. Funnel	$2.45	2.65	2.85	3.30

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—
Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe...70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 65%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ℔ doz.$4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ℔ doz. $24.00.....45&10%

Door—
Bardsley's.....45%
Empire.....50%
Pullman.....50%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—
Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—
Hooks, Bench, see Stops, Bench.
Bush, Light, doz. $1.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....*$1.30*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....*60&5@60&10&5%*
Malleable Iron.....*70@70&10%*
Covert Mfg. Co. Gate and Seattle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—
From 4 to 10.....*lb. 3 @3½¢*
R. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	63	62	75	72
Tin'd Tops	70	67	80	77

New England Pressing..*lb. 3¾@4¢*

Pinking—
Pinking Irons.....*doz. 60¢*

Irons, Soldering
See *Coppers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130..50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Wilcut Brand Knives and Hooks.....60%
Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.75@6.00
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—
Buffalo.....℔ gro. $13.00

Miscellaneous—
Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@$1.50*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel, *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....50%

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz. $4.25@4.50
Lift Tubular, No. 0.....
doz. $4.75@5.00
Hinge Tubular, No. 0.....
doz. $4.75@5.00
Other Styles.....*40@40&5%*

Bull's Eye Police—
No. 1, 2¾-inch.....*$2.75@3.00*
No. 2, 3-inch.....*$3.00@3.25*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw..
doz. 35@40¢

Door—
Allith Mfg. Co., Automatic, No. 400, ℔ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—
Wire Clothes, Nos. | 18 | 19 | 20
100 feet..... | $2.25 | 2.00 | 1.75
75 feet..... | $1.75 | 1.35 | 1.10
Anniston Waterproof Clothes, 50 ft., ℔ gro., $25.00; Gilt Edge, $23.00: Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines; No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks...*33⅓@33⅓&7½%*

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%

Elevator—
Stowell's.....50%

Padlocks—
Wrought Iron....*75&10&5@80&5%*
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 62½%; Crescent, 50&10%; Iron, 62½%; Window Ventilating, 60%; Robinson Pat. Ventilating Sash Lock, 40%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Reisinger Invincible Hand Power.....
℔ doz. $18.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—
Chandler's.....12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$26.00
Cint. Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—
Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list..50&10%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria..50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M. S. C. K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—
Wire Nails and Brads, Miscellaneous.....*85&10@85&10&5%*
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
Anchor	22	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....30%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Western						℔ lb 8½¢

Jobbers' Special Brands.....
per lb. 9@10¢

Picture—

	1½	2	2½	3	in.
Brass H'd.	.45	.55	.60	.70	.. gro
Por. Head...	1.10	1.10	1.10		.. gro

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: *Off list.*
Square, Blank or Tapped..
4.90@5.00¢
Hexagon, Blank or Tapped..
5.30@5.40¢
Square, Blank, C. & T.5.20@5.30¢
Hexagon, Blank, C. & T...
5.90@6.00¢
Hot Pressed:
Square, Blank.....*5.10@5.20¢*
Hexagon, Blank.....*5.50@5.60¢*
Square, Tapped.....*5.00@5.10¢*
Hexagon, Tapped.....*5.40@5.50¢*

Oakum—
Best.....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum.....*3½¢*
In carload lots ½¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10&5&10%*
Zinc.....*65&10&5@70%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle.....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National.....50&10%
Stowell's Sprague.....℔ doz. 35@45¢
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope.....*17@22¢*

Rubber—
(*Fair quality goods.*)
Sheet, C. I......*11@12¢*
Sheet, C. O. S......*11@12¢*
Sheet, C. B. S......*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....*65&10%*

Fry—
Common Lipped:

Nos.	1	2	3	4	5
Per doz.	.0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz	$1.75	2.25	2.80	3.15

Roasting and Baking—
Regal, R. M. Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	6¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.	8¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.	7¢

	Per roll
Rosin Sized Sheathing, 500 sq. ft Light weight, 25 lbs. to roll	*35@40¢*
Medium weight, 30 lbs. to roll	*40@45¢*
Heavy weight, 40 lbs. to roll	*56@60¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton	*$18.00*
Red Rope Roofing, 250 sq. ft. per roll	*$1.75*

Tarred Paper—

1 ply (roll 500 sq. ft.), ton	*$32.50@35.50*
2 ply, roll 108 sq. ft	*55¢*
3 ply, roll 108 sq. ft	*75¢*
Slater's Felt (roll 500 sq. ft.)	*70¢*

Sand and Emery—
Flint Paper and Cloth..*50&10@60%*
Garnet Paper and Cloth....*25%*
Emery Paper and Cl'h..*50&10@60%*

Parers— Apple—

Advance	℔ doz.	$4.00
Baldwin	℔ doz.	$4.00
Bonanza Improved	each	$6.50
Daisy	℔ doz.	$4.00
Dandy	each	$7.50
Eureka Improved	each	$20.00
Family Bay State	℔ doz.	$15.00
Improved Bay State	℔ doz.	$36.00
Little Star	℔ doz.	$8.00
New Lightning	℔ doz.	$7.00
Reading 72	℔ doz.	$3.25

Reading 78.....℔ doz. $6.25
Rocking Table.....℔ doz. $6.20
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00

Potato—

Saratoga.....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899.....75@75&5%
Cronk's Handled Garden M—.....
℔ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass.....50&10@60%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.

*Standard, 2-6 in.*50&10@50&10&5%
Extra Heavy, 2-6 in......65&10%
Fittings.....70&10@70&10&5%

Pipe, Merchant—

Consumers, Carloads.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
⅛ & ¼ in.	71%	55%	68%	52 %
⅜ in.	73%	59%	70%	56 %
½ in.	75%	63%	72½	60 %
¾ to 6 in.	79%	69%	76½%	66½%
to 12 in.	74%	59%	71½%	56 %

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71%
*Maryland, Delaware, E. Pa.*73%
West. Pa. and West Va....75%
Virginia.....76%
Ohio, Michigan and Ky....75%
Indiana.....77%

NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....35@35&10%
Bench, second qual...45@45&10%
Molding.....30@30&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....35@35&10%
Bench, Second Quality....45@45&10%
Molding.....30@30&10%
Toy and German.....35@35&10%
Chaplin's.....60%
Union.....60%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Union.....60%

Plane Irons—

Wood Bench Plane Irons.....
25@25&10%
Buck Bros.....30%
Chapin-Stephens Co.....25@25&10%
Stanley R. & L. Co.....35%
Union.....50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $8.50

Plates—

Felloe.....lb. 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ℔ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
F., S. & W. Tinners' Cutting Nippers.....40%
Wm. Scholl horn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Lodi, 50%; Paragon, 50%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&5%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10&5%
Extension Sights.....30@30&10&5%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable.....40&7½%
Stanley R. & L. Co.....45%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers.....lb. 10¢
½-lb. papers.....lb. 9@10½¢
¼-lb. papers.....lb. 9¾@11¢

Pokes, Animal—

Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's.....25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.). ℔ doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans... ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside.....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese.....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans... ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $8.00
1 qt., Round.....gro. $9.00
1½ qt., Square.....gro. $10.00
2 qt., Square.....gro. $12.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75
Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail—

Cyclops.....50%
Miller's Falls, No. 3, ℔ doz., $12.00...
33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, case lots, ℔ doz., No. 2, $6.00; No. 3, $5.50.
Giant, No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15.....33⅓%
Staple Pullers.....60%
Parrot Tack and Stub Puller, ℔ doz., 75c.; ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz.	$0.65	.85	1.20
Inch	1¼	1½	1¾ 2
Screw, doz.	$0.16	.19	.23 .30
Inch	1¾	2	2¼ 2½
Side, doz.	$0.25	.40	.55 .60
Inch	1½	1¾	2 2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....16@15¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....17@15¢
Acme.....1½ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal.....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list).....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good.....
doz. 50@75¢
Spring, single tube, good quality.....$1.75@2.00
Revolving (4 tubes).....
doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Scholl horn Co.:
Bernard.....33⅓%
Lodi, 50%; Paragon.....50%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co...40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44.....60%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron....
2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track.....50%
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾¢
O. N. T. Rail.....2½¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., $3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.25; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better.....℔ ft. 3¾¢
Standard.....℔ ft. 4 ¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.....
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Stowell's:
Cast Rail.....℔ ft. 1¾¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....℔ ft. 3¢
Wrought Bracket, 1½ x 5-16...℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. J. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—

NOTE.—Many goods are sold at net prices.

Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz. 12 teeth, $15.00; 14, $16.50; 16, $18.00.....80%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Boras—I C.....60%
Fox Razors, ℔ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $25.00. } Dis. 40%
Red Devil.....50%
Silberstein:
Carbo Magnetic, $18.00; Griffon, No. 65, $15.00; Griffon, No. 00, $12.00; all other Razors, 40%.

Safety Razors—

Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein.....40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33⅓%; 2904 PN..33⅓%; 0924 N., 33⅓%; 02004 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%.....
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed.....70%
White Porcelain Enamel.....60%
Solid Brass or Bronze Metal.....
40&10%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic.....$3.25
Hammerless.....$3.75

Riddles, Hardware Grade

16 in......*per doz.*$2.50@$2.75
17 in......*per doz.*$2.75@$3.00
18 in......*per doz.*$3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	2½	*3 inch.*
Steel	$0.70	0.75	0.80 *doz.*
Copper	$1.00	1.15	1.40 *doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron.....
doz. 50@55¢
Hill's Ringers, Malleable Iron..
doz. 70@75¢
Blair's Rings...*per gro.*$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..*per gro.*$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper.....45@45&5%
Iron or Steel.....75@75&5%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—

Acme, Stowell's Anti-Friction.....50%
Cronk's Stay No. 65, $0.90; No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure.....lb., 12½¢
Sisal, 7-16 in. diam. and larger:
Pure.....lb., 9¢
Sisal, 7-16 in. diam. and larger; No. 2 quality.....lb., 7¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....lb., 7¾¢
Pure.....lb., 9¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed.....lb., 7¾¢
Pure.....lb., 9¢
Cotton Rope:
Best, ¼-in. and larger..16½@18¢
Medium, ¼-in. and larger,
15½@16½¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb.7½¢
Thread, No. 2, ¼-in. & up, lb..7¢
Old Colony Manila Transmission Rope.....℔ lb 17½¢

Wire Rope—

Galvanized.....37½&21½%
Plain.....45&21½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute, 45%; Sisal.....33⅓%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold .....27½&10&10%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Stephens' Combination.....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60%
Stanley R. & L. Co.:
Boxwood 67½%
Ivory 45%
Miscellaneous 60%
Zig Zag.....40%
Zig Zag, Pin Joint.....42½%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band .....50&10&60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw, 40%; Wood Saws, 40%; Hand, Compass, &c., 40%.
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide.....60%
Band, ¼ to 1¾.....60%
Crosscuts 50%
Narrow Crosscuts.....55%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77 & 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws.....30%
Hand Saws.....20&2½%
Wood Saw Blades.....35%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemacu Mfg. Co.'s Cross Cut Saws.....50%

Hack Saws—
Atkins' Hack Saw Blades A A A...25%
Disston's:
Concave Blades.....25%
Keystone 40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180.....40&7½%
Hack Saws, Nos. 175, 180, complete.....40&7½%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades.....35%
Diamond Hack Saw Frames.....50%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....25%
Victor Hack Saw Frames.....40%

Scroll—
Barnes, No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $15; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scales—
Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. .....doz. $5.90
Two Platforms, ½ oz. to 8 lbs. .....doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective"....25 to 50%
Union or Family No. 2.....60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list)..20@35%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon..50%

Scrapers—
Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.50@2.60
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00.....15%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Maine Screen Frames.....40&10&5%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench Wood .....25@25&5%
Hand, Wood .....25@25&5%
H. Buss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand.....25%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 .....75&15%
Coach, Gimlet Point, list Oct. 1, '99.....75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—
Standard List.....75&10@80%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P. S. & W.....50%
Swett Iron Works.....75@80%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—
Set (Iron).....80@80&5%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....75%
Hex. Hd. Cap.....75%
Rd. Hd. Cap.....60&10%
Fillister Hd. Cap.....60&10&10%

Wood—
List July 23, 1903.
Flat Head, Iron.....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass.....82½&10%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze..75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
	Per doz.
Grass, No. 1, Plain	$6.25@6.75
Clipper, Bronzed Webb	$6.50@7.00
No. 3 Clipper, Pol'd Webb	$6.75@7.25
No. 6 Clipper and Solid Steel,	$7.00@7.50
Bush, Weed and Bramble, No. 2	$6.50@7.00
Grain, No. 1	$8.25@8.75
Bronzed Webb, No. 1	$8.50@9.00
Nos. 3 and 4 Clipper, Grain	$8.75@9.25
Solid Steel, No. 6	$9.25@9.75

Seeders, Raisin—
Enterprise .....25@30%

Sets—Awl and Tool—
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel.....₩ doz sets $9.00

Sets, Nail—
Octagon .....gro. $3.50@3.75
Buck Bros.....27½%
Cannon's Diamond Point, ₩ gro.$12.40%
Mayhew's .....₩ gro. $9.00
Snell's Corrugated Cup Pt...₩ gro. $7.20
Snell's Knurled, Cup Pt....₩ gro. $7.20
Springfield Mach. Screw Co.: Diamond Knurled Cup Pt.₩ gro. $7.50

Rivet—
Regular list.....75@75&10%

Saw—
Aiken's:
Genuine .....50&10%
Imitation .....50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut.....30%
Plate 20%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.60.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal Cross Cut.....₩ doz. $8.90
Royal, Hand.....₩ doz. $4.50
Taintor Positive.....₩ doz. $6.75

Shaving
Fox Shaving Sets, No. 20.....₩ doz., net, $24.00
Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co.....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz.....$1.50
Mounted Kitchen Sand Stone, ₩ doz.....$1.50
Natural Grit Carving Knife Hones, ₩ doz.....$3.00
Quick Cut Emery Carving Knife Hones, ₩ doz.....$1.50
Quick Edge Pocket Knife Hones, ₩ doz.....$2.50

Skate—
Smith & Hemenway Co.....20%

Shaves, Spoke—
Iron .....doz.$1.10@1.25
Wood .....doz.$1.75@2.25
Bailey's (Stanley R. & L. Co.).....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ₩ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—
Cast Iron..	7	8	9 in.	
Best	$16.00	18.00	20.00	gro.
Good	$13.00	15.00	17.00	gro.
Cheap	$5.00	6.00	7.00	gro.

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fair quality, Nickel..75@75&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailor's Shears.....10%
Wilkinson's Sheep, 1900 list, 30&10&5%; Grass, 50&10%; Horse or Mule, 50&10%

Tinners' Snips—
Steel Blades.....20&5&20&10%
Steel Laid Blades....40&10&10%
Forged Handles, Steel Blades, Berlin.....50@50&5%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in.....50%
Niagara Snips.....40%
P., S. & W. Forged Handles.....20%

Pruning Shears—
Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears....33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00.....25%
Disston's Pruning Hook, ₩ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....50&10%
P., S. & W. Co.....33⅓%
Wilkinson's Hedge, Wilcut Brand, 60&10%
Wilkinson's Lawn and Border, Wilcut Brand.....60&10%

Sheaves—Sliding Door—
Stowell's Anti-Friction.....50%
Reading 40%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—
Reading list.....40%
R. & E. list.....33⅓%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival, 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge.....20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓
Robin Hood, Low Brass.....20&5%
Robin Hood, High Brass.....30&5%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade'.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron .....per keg $4.00
Steel .....per keg $3.75
Burden's, all sizes.....₩ keg $3.90

Shot—
Drop, up to B, 25-lb. bag....$1.85
Drop, B and larger..... per 25-lb. bag, $2.10
Buck, 25-lb. bag.....$2.10
Chilled, 25-lb. bag.....$2.10
Dust, 25-lb. bag.....$2.30

Shovels and Spades—
Association List, Nov. 15, 1902..40%

Snow Shovels—
Long Handle.....$2.75@3.00
Wood and Mail, D. Handle..... $3.25@3.50

Sieves and Sifters—
Hunter's Imitation..... gro.$9.50@10.00
Hunter's Genuine..... per gro. $12.00@12.50
Buffalo Metall'c Blued, R. M. Co., ₩ gr.

14&16	18&18	18&20
$11.70	$13.50	$14.40

Sieves, Seamless Metallic
—Per dozen.—

Mesh	14	16	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in....60&5%
20 x 40 to 24 x 50 in.....55%
24 x 60 to 24 x 120 in.....35%
Barnes' low list:
Up to and including 20 x 36 in....60%
20 x 40 to 24 x 50 in.....35%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron.....80@80&10%
Steel .....40@40&10%

Slates, School—
Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless..60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German .....40@40&10%
Covert Mfg. Co.:
Derby, 30&2%; Yankee, 30&2%; Yankee Roller, 30&2%.
High Grade, 45%; Trojan.....45%
Jockey 35%
Oneida Community:
Harness Snaps, 1 inch.....60&5%
Swivel Snaps.....60%
Swivels 50%

Snaths—
Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous—
German Silver.....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver.....50%

Tinned Iron—
Teas .....per gro. 45@50¢
Tables.....per gro. $0.50@$1.00

Springs—Door—
Chicago (Coil).....40&10%
Gem (Coil).....20
Pullman (Coil).....25%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 30 in.....₩ doz. $1.10

Carriage, Wagon, &c.—
1¼ in. and Wider:	Per lb
Black	4@4¼¢
Half Bright	4@4¼¢
Bright	4½@4¾¢

Painted Seat Springs:
1½ x 2 x 26.....per pr. 42¢
1½ x 3 x 28.....per pr. 70¢

Sprinklers, Lawn—
Enterprise .....25@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $20.....30%
Pleuger & Henger Mfg. Co.:
Cactus, 70%; Japanese, 75%; Nationals, 65%.

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron.. } *75&10@75&10&5%*
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2.....30%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—
Barbed Blind.....lb. 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3¾¢
Grand Crossing Tack Co.'s list..80&15%

Steels, Butchers'—
Dick's 30%
Foster Bros.....30%
C. & A. Hoffmann's.....40%

Steelyards—....30@30&10%

Stocks and Dies—
Blacksmiths'.....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plates.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—
Enterprise .....25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit.60%
Gem Corundum Axe, Single or Double Grit.....60%
Gem Corundum Slips.....60%
Gem Corundum Razor Hones....50%
Pike Mfg. Co., 1904 list: ₩ lb.
Arkansas St. No. 1, 3 to 5½ in.$2.80
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in...60¢
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in.40¢
Washita St., No. 2, 4 to 8 in.30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%

Hindostan No. 1, R'g'lar, ₩ lb 8¢
Hindostan No. 1, Small, ₩ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in. ₩ lb 90¢ } 33⅓%
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips 40¢
Sand Stone 6¢

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₩ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots ₩ gro. $9.00
One gross or more ₩ gro. $7.20
Lots of 10 gross or more ₩ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S. ₩ gro. $12.00
Lamoille S. S. ₩ gro. $11.00
White Mountain S. S. ₩ gro. $9.00
Green Mountain S. S. ₩ gro. $6.00
Extra Indian Pond S. S. ₩ gro. $7.50
No. 1 Indian Pond S. S. ₩ gro. $7.00
No. 2 Indian Pond S. S. ₩ gro. $4.50
Leader Red End S. S. ₩ gro. $4.50
Quick Cut Emery ₩ gro. $10.00
Pure Corundum, ₩ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓% } 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ₩ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ₩ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 60@60&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Cary's Universal, case lots 25&20%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. *60@60&10%*
Socket doz. $1.60
Bullard, ₩ doz. $1.00
Excelsior Stretcher and Tack Hammer Combined, ₩ doz. $6.00 20%

Strops, Razor—

Star Diagonal Strop 25%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%

Sweepers, Carpet—

National Sweeper Co.: ₩ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated $72.00
Sheraton, Roller Bearing, N'kel. $60.00
Ye Mission, Roller Bearing, Oxidized Coppered $36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled $36.00
National Queen, Roller Bearing, Fancy Veneers $27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel. $24.00
Marion Queen, Roller Bearing, Nickeled $24.00
Monarch, Roller Bearing, N'kel. $22.00
Monarch, Roller Bearing, Jap. $20.00
Perpetual, Regular B'r'gs, N'kel. $20.00
Perpetual, Regular B'r'gs, Jap. $18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled $36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned $33.00
Auditorium (26 in. case), Roller Bearing, Nickeled $54.00
Mammoth (30 in. case), Roller Bearing, Nickeled $60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire ₩ doz $25.00
Model A, Sterling ₩ doz. $25.00
Model B, Sterling, Nickeled ₩ doz. $23.00
Model B, Sterling, Japanned. ₩ doz. $21.00
Model C, Sterling ₩ doz. $21.50
Model D, Sterling ₩ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks 90&40&10%
American Cut Tacks 90&40&10%
Swedes Cut Tacks 90&40&10%
Swedes Upholsterers' 90&50&10%
Gimp Tacks 90&50&10%
Lace Tacks 90&40&10%
Trimmers' Tacks 90&40&10%
Looking Glass Tacks 65&10%
Bill Posters' and Railroad Tacks 90&50&10%
Hungarian Nails 85&10%
Finishing Nails 70&10&10%
Trunk and Clout Nails 80&10%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks 90&5 or 6 lots

See also Nails, Wire.

Tanks, Oil— Each.

Emerald, R. M. Co. 30-gal. $3.40
Emerald, R. M. Co. 60-gal. $4.25
Queen City, R. M. Co. 30-gal. $3.65
Queen City, R. M. Co. 60-gal. $4.50

Tapes, Measuring—

American Asses' Skin 50&10%
Patent Leather 25@30&5%
Steel 33⅓&5%
Chesterman's 35@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop 80&2½%
Monitor, Cross Head, &c. 70%

Brick Ties—

Niagara Brick Ties 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s 35%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida 75@75&5%
Newhouse 40@40&5%
Hawley & Norton 60%
Victor 70&10%
Oneida Community Jump 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Trap (Genuine):
No. 1, Rat, each $1.21; ₩ doz. $13.25
No. 3, Rat, ₩ doz. $6.50; case of 56 $5.75 doz.
No. 3½, Rat, ₩ doz. $5.25; case of 72 ₩ gro. $1.70 doz.
No. 4, Mouse, ₩ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ₩ doz. $3.00; case of 150

Trimmers, Spoke— $2.25 doz.

Wood's E 1 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, ₩ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels. ₩ gro. $6.00
Rose Brick and Plastering 25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ₩ doz. $16.00
Grocery ₩ doz. $15.00
Daisy Stove Trucks, Improved Pattern ₩ doz. $18.50
McKinney Truck each $10.00
Model Stove Trucks ₩ doz. $18.50

Tubs, Wash— *No. 1 2 3*

Galvanized, per doz. $4.25 4.75 5.25
Galvanized Wash Tubs (R. M. Co.):
No. 1 2 3 10 20 30
Per doz., net $5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine: BC. B.
No. 9, ¼ and ⅓-lb. Balls .22@24¢
No. 12, ¼ and ⅓-lb. Balls .18@20¢
No. 18, ¼ and ⅓-lb. Balls .16@18¢
No. 24, ¼ and ⅓-lb. Balls .16@18¢
No. 36, ¼ and ⅓-lb. Balls .15@17¢
Chalk Line, Cotton ½-lb. Balls 25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. 10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality 14½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 13@14¢
American 3-Ply Hemp, 1-lb. Balls 13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 9¢
India 3-Ply Hemp, 1-lb. Balls 9¢
India 3-Ply Hemp, 1½-lb. Balls 7½@8½¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls 9½@10½¢
Mason Line, Linen, ½-lb. Bls. 16¢
No. 263 Mattress, ¼ and ½-lb. Balls 37¢
Wool, 3 to 6 ply B 7¢; A 7½¢

Vises—

Solid Box 60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting 25@25&5%
Tiger Machinists' 40%
Fisher & Norris Double Screw 15&10%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect, 20%; Lightning Grip 20%
Merrill's 20%
Millers Falls 60&10%
Parker's:
Victor, 20@25%; Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₩ doz. $30. 25%
Perfection Saw Clamps, ₩ doz. $4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1 2 and 3. 45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60&10%
Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.* Dis. 15%

B. E., 11 up 60¢
B. E., 9 and 10 70¢
B. E., 8 80¢
B. E., 7 80¢
P. E., 11 up $1.00
P. E., 9 and 10 1.25
P. E., 8 1.50
P. E., 7 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Ware, Hollow, Cast Iron, Hollow

Stove Hollow Ware:
Enameled 53%
Ground 60%
Plain or Unground 65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles 70%
Covered Wares
Tinned and Turned 40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 60%
Iron Clad Ware 70&10%
Lava, Enameled 40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&5&50&10%
Never Break Spiders and Griddles 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ₩ doz.
Crescent, family size, bent frame $3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.90
Cable Cross, family size, stationary protector $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back $2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.25

Washers—Leather, Axle—

Solid 80&10@80&10&10%
Patent 90@90&5%
Coil: ⅛ ¼ 1¼ 1¼ *Inch.*
10¢ 11¢ 12¢ 13¢ *per box*

Iron or Steel—

Size bolt 5-16 ⅜ ½ ⅝ ¾
Washers $5.40 4.50 3.20 3.00 2.80
The above prices are based on $6.00 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4 40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 50&10%

Wedges—

Oil Finish lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co. 40%

Sash—

Per ton, f.o.b. factory:
Eastern District $27.50@$28.00
Southern Territory $20.00@$23.00
Western and Central Districts $23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 80%
10 to 18 80&2½%
19 to 26 80&7½%
27 to 36 80&2½%
Galvanized:
6 to 9 75&5%
10 to 14 75&7½%
15 to 16 72½&10&2½%
19 to 26 75%
27 to 36 72½%
Coppered:
6 to 9 75&5%
10 to 14 75&7½%
15 to 18 72½&10&2½%
19 to 26 75&10&5%
27 to 36 75%
Tinned:
6 to 14 75&10&2½%
15 to 18 75&7½%
Annealed, Steel and Tinned, on Spools 70&10&10@70&10&10&10%
Brass and Copper on Spools 60&5@60&10&5%
Brass, list Feb. 26, '96 15%
Copper, list Feb. 26, '96 25%
Cast Steel Wire 50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24 '03 90&20@90&25%
Brass Cup Hooks and Brass Screw Hooks 85@—%

Wire Cloth and Netting—

Galvanized Wire Netting 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3 ¢
Nos. 4 and 5 Mesh, sq. ft. 3¼¢
No. 6 Mesh, sq. ft. 3½¢
No. 8 Mesh, sq. ft. 4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 75&10&5@80%
Alligator or Crocodile 70&10@75%
Baxter Pattern S Wrenches 70&5@70&10%
Drop Forged S 40@45&5%
Acme 60&10%
Alligator Pattern, 70%; Bull Dog 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Bemis Pipe 60%
Combination Black 40&5%
Merrick Pattern 50%
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model 40&10&5&5%
Coes', Genuine Hammer Handle 40&10&5&5%
Coes' "Mechanics'" 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 50&10%
Elgin Wrenches, ₩ doz. $6.25
Elgin Rethreading Attachment, one die, ₩ doz. $6.25
Elgin Extra Dies, ₩ doz. $3.00
Elgin Extra Jaws, ₩ doz. $1.75
Elgin Monkey Wrench Pipe Jaws, ₩ doz. $2.13
Gem Pocket 20%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P. S. & W. 50&5%
Stillson 65%
Vulcan Chain 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₩ gross, $7.50; ₩ doz. $0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₩ doz. $13.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '02 90@90&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' list net

Zinc—

Sheet per 100 lbs., $8.15@8.40

For the Table of "Current Metal Prices" see the First Issue of Every Month.